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The ATARI® Resource

DECEMBER 1985 VOLUME 4, NUMBER 8



Fourth Annual SHOPPERS GUIDE

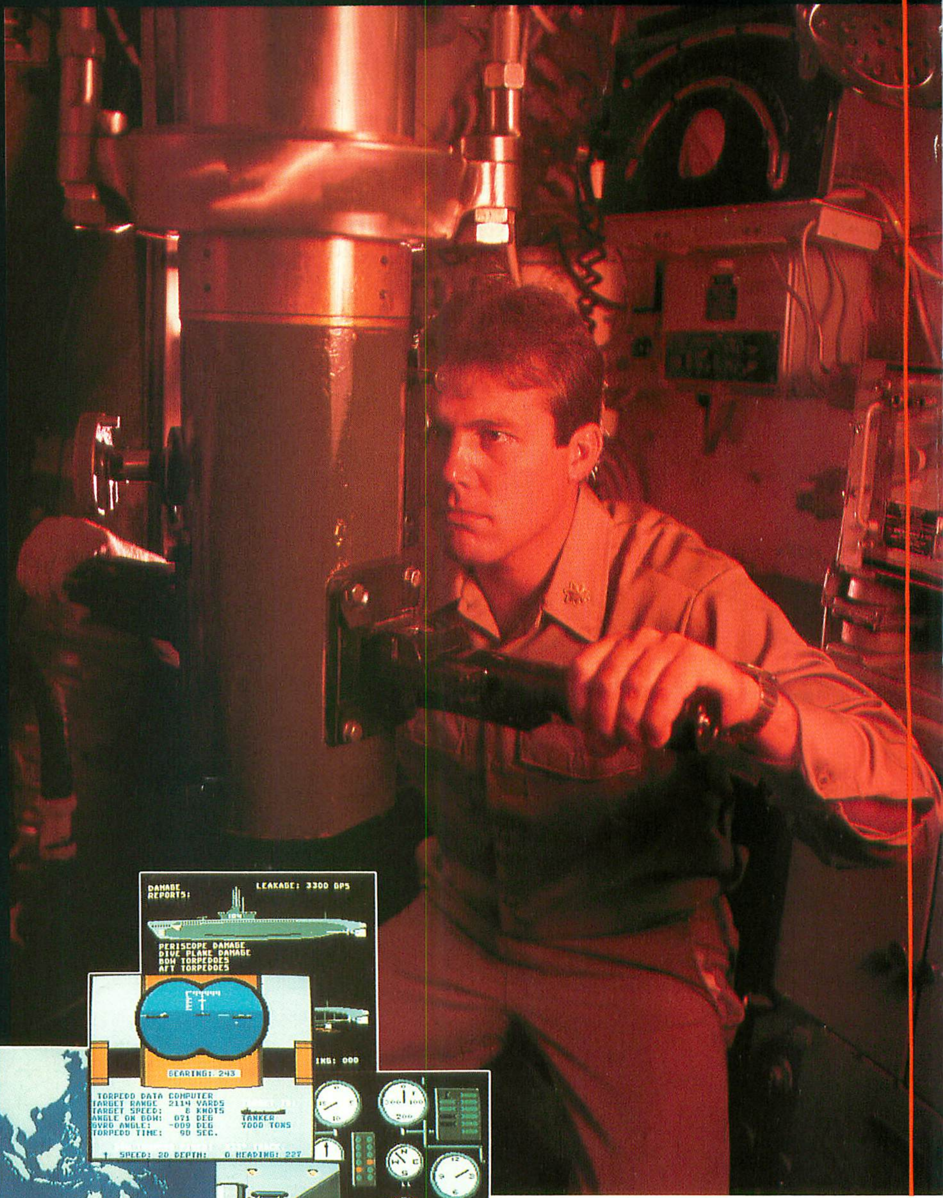
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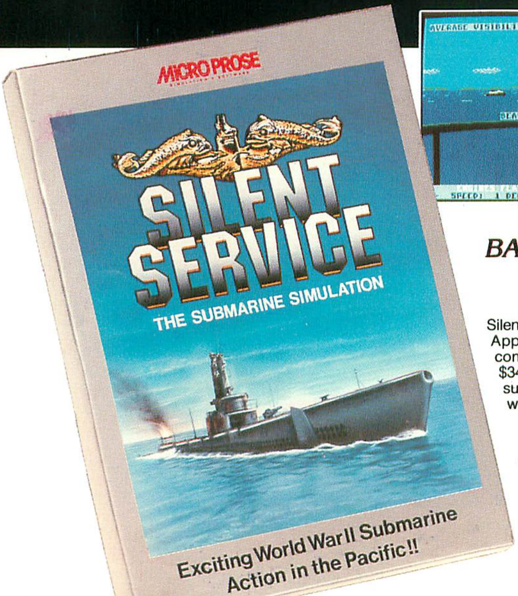


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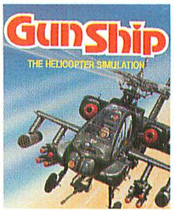
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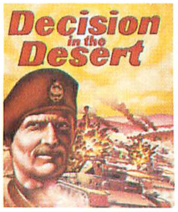
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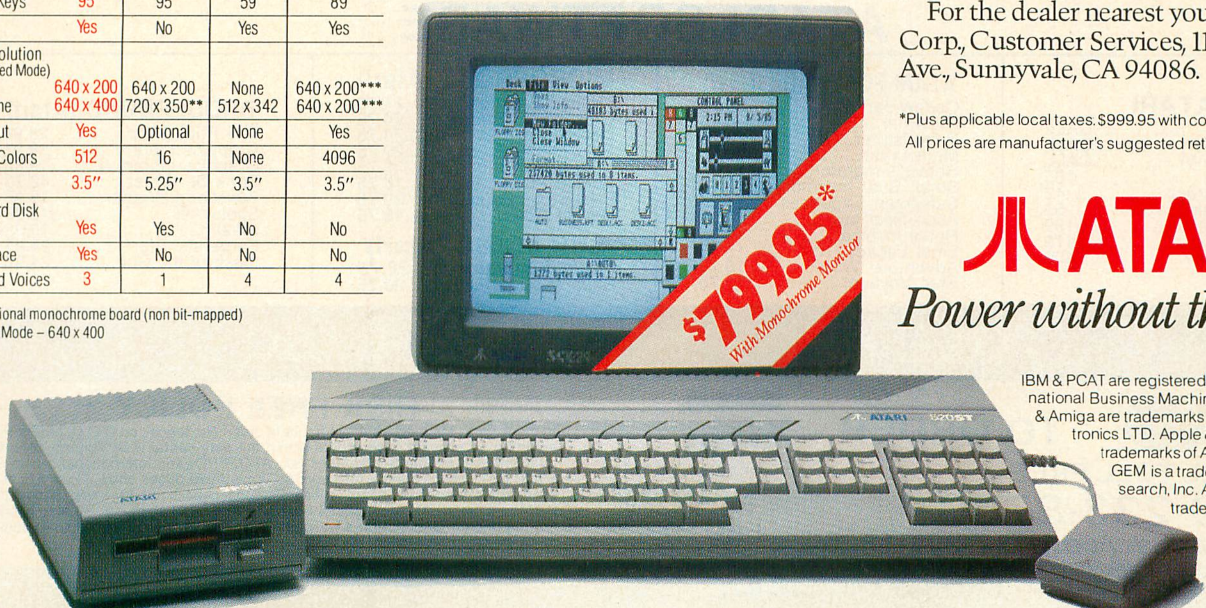
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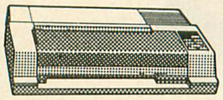


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- GP700AT (Atari) ... 439
- GP700AP (Apple) ... 439
- ELITE5CD (C-64) ... 229

C. ITOH
- 8510Ap+ ... 299
- 1550P ... 437
- 1550BP ... 437
- 1550EP ... 437
- 1550BCD ... 469
- F10-40 ... 859
- F10-55 ... 1039
- 7500AP ... 204
- 7500AR ... 244

TOSHIBA
- P1340 ... 557
- P351 ... 1286

CARDCO
- 32K BUFFER..(C-64) ... 59

CORONA
- LP300 Laser Printer ... 2686
- 200361 Toner Cartridge ... 89

EPSON
- FX85 (New) ... 333
- LX80 ... 212
- FX185 (New) ... 464
- LX90 (New) ... 226
- SQ2000 (New) ... 1555
- JX80 ... 467
- Homewriter 10 ... 193
- CR-20-Atari ... 153
- CR-220-C-64 ... 153
- DX-10 (New) ... 207
- DX-20 (New) ... 297
- HS-80 (New) ... 288
- LQ1500P ... 975
- LQ1500S ... 1039
- RX-100 ... 356
- FX-100+ ... CALL

CITIZEN
- MSP-10 ... 269
- MSP-15 ... 358
- MSP-20 ... 337
- MSP-25 ... 495
- Sheetfdr (10/20) ... 189
- Sheetfdr (15/25) ... 199

OKIDATA
- Okimate 10 ... 179
- Okimate 20 ... CALL
- 182 ... 214
- 192 + ... 348
- 193 ... 563
- 92P ... 349
- 93P ... 565
- 84P ... 645
- 92 Imagewriter ... 349

*IBM versions also

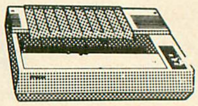
BROTHER
- HR-15XL-P ... 359
- HR-15XL-S ... 359
- HR-35P ... 839
- HR-35S ... 839
- 2024L-P ... 949
- M1009-P ... 189

JUKI
- Juki 6100 ... 347
- RS232 Serial Board ... 55
- 6100 Tractor ... 119
- 6100 Sheet Feeder ... 209
- Juki 6300 ... 757

LEGEND
- 880 ... 188
- 1080 ... 222
- 1380 ... 262
- 1385 ... 296

DIGITAL DEVICES
- 16K BUFFER ... 75
- 32K BUFFER ... 89
- 64K BUFFER ... 125

DIABLO
- D25 ... 549
- 630API ... 1599
- 630ECS ... 1759
- D801F ... 2395
- P32CQ1 ... 699
- P38 ... 1749
- C150 ... 999



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PANASONIC
- 1091 ... 233
- 3131 (NEW) ... 269
- 1092 ... 373
- 1093 ... 426
- 3151 Letter ... 426
- 4K Buffer ... 65

SILVER REED
- EXP400 ... 249
- EXP500 ... 295
- EXP550 ... 399
- EXP770 ... 749

STAR MICRONICS
- *SG-10* ... 208
- SG-15 ... 373
- SD-10 ... 336
- SD-15 ... 442
- SR-10 ... 483
- SR-15 ... 583
- Powertype ... 303
- SB-10 ... CALL
- SG-10C-64 (NEW) ... CALL

MONITORS

AMDEK
- 300 Green ... 118
- 300 Amber ... 128
- 310 Amber IBM ... 155
- Color 300 Audio ... 234
- Color 500 Composite ... 369
- Color 600 ... 397
- Color 700 ... 495
- Color 710 ... 569

X-TRON
- Comcolor I Composite Green. 177

PANASONIC
- DT1300D 13" RGB/Composite ... 247
- DTM140 14" RGB/Composite ... 329
- DTH103 10" RGB Hi Res ... 395
- DTS101 10" Composite ... 175
- DT1000G 10" RGB ... 166
- TX12H3P 12" Color ... 419
- TR120M1PA 12" Green ... 109
- TR120MBPA 12" Amber ... 109
- TR122M9P 12" Green IBM ... 148
- TR122MYP 12" Amber IBM ... 148

NEC
- JB-1260 Green ... 95
- JB-1201 Green ... 135
- JC 1215 Color ... 235
- JC 1216 RGB ... 375
- JC1460 Color ... 265
- JB-1205 Amber ... 139

PRINCETON GRAPHICS
- MAX-12 Amber ... 185
- HX-12 RGB ... 465
- SR-12 RGB ... 595

ZENITH
- ZVM 122A Amber ... 75
- ZVM 123G Green ... 75
- ZVM 124 Amber IBM ... 129
- ZVM 131 Color ... 275
- ZVM 133 RGB ... 389
- ZVM 135 Composite ... 449
- ZVM 136 Hi Res Color ... 589

SAKATA
- SG1000 12" Green ... 99
- SA1000 12" Amber ... 109
- SG1500 12" Green TTL ... 119
- SA1500 12" Amber TTL ... 129

TAXAN
- 115 12" Green Composite ... CALL
- 116 12" Amber Composite ... CALL
- 121 12" Green TTL ... 135
- 122 12" Amber TTL ... 145
- 220 14" Color Composite ... 259
- 410 12" RGB Hi Res IBM ... 329
- 420 12" RGB Super Hi IBM ... 409
- 440 12" RGB Ultra Hi Res ... 555
- Tilt Stand ... 35

MODEMS

HAYES
- SMARTMODEM 300 ... 133
- SMARTMODEM 1200 ... 377
- SMARTMODEM 1200B ... 347
- SMARTMODEM 2400 ... 598
- MICROMODEM IIE ... 135

MICROBITS
- MPP100E (ATARI) ... 75

DIGITAL DEVICES
- U-Call AT300 Modem ... 99
- U-Call AT1200 Modem ... 199
- 1200 Upgrade Kit ... 89

DRIVES

INDUS Atari 199

INTERFACING

AXIOM
- AT846 (Atari) ... 65

ATARI
- 850 Interface ... 109

DIGITAL DEVICES
- ApeFace XLP (Atari) ... 49
- U-Print A (Atari) ... 54
- U-CALL RS232 (Atari) ... 37

CARDCO
- C/?AT (Atari) ... 49

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- 1025 Printer ... 159
- 1027 Printer ... 179
- 850 Interface ... 109

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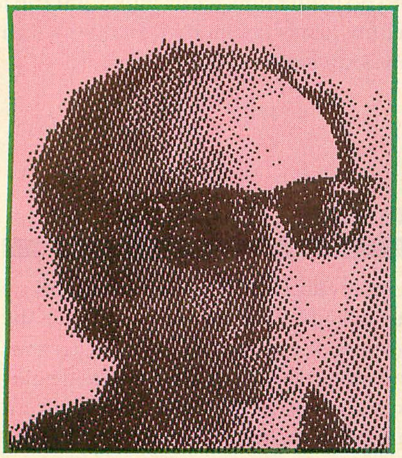
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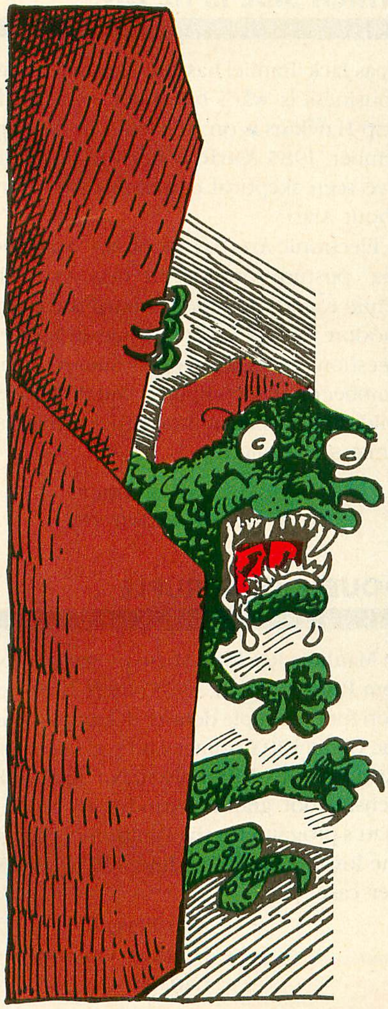
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The ATARI® Resource DECEMBER 1985, VOLUME 4, NUMBER 8

ST Shoppers Guide page 45



Graphic goodies 14



Harold and Gruck 79

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ST SECTION

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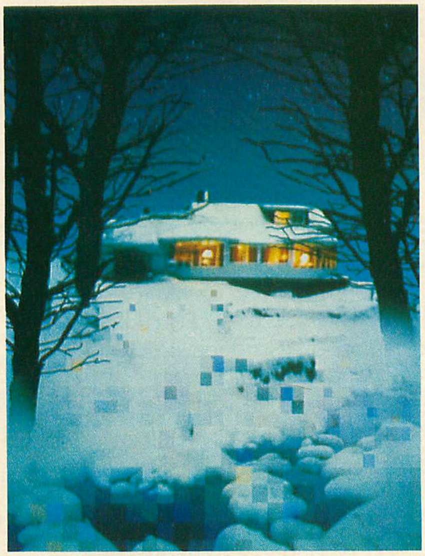
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i/o board



ABOUT THE COVER

Artist: Eduardo Gutekunst

System: Quantel Paintbox, Varitel Video, San Francisco, Ca.

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LUCKY STRIKES?

I have had my Atari 800 for two years and I've been using it every day (except when I was on vacation) and I have never had a single problem yet.

But one day I was using my computer during a thunderstorm. With my good luck, the lightning had already blown up my computer drive and my modem. At least I was not using all my equipment at the time. So I brought my 800 computer to a computer store to get fixed and I left it there.

A week later, I came back to bring it home again. But when I arrived at the store, my good luck happened to me again. Before my eyes, I found the store in flames!

I talked to my insurance company and they said they would buy me a new computer. Then the computer store owner guy also said he would buy me another new computer. At that moment, I realized I could buy almost *any* computer I wanted.

So, I went to the store and I looked at a lot of PCs. But I only want another 800 (*not* an XL). No matter what price I offer and no matter how hard I look, I just can't get my hands on another Atari 800. Can anybody help me out?

Chris Puzzele
Milltown, N.J.

NEW BBS LIST ONLINE

Temple (Texas) ACE has set aside 170K on our group's Poor No Name BBS for the purpose of maintaining the most accurate and up-to-date list of Atari-oriented bulletin boards possible. Please leave your information on our BBS at (817) 778-2506. My CompuServe ID is 74206,1464.

James Weslowski
Temple, Texas

WHICH SIDE IS HE ON?

If, as Jack Tramiel has been known to say, "business is war," I wonder which side Trip Hawkins is on. His letter in the September, 1985 **Antic** is not the first time I've seen skeptical comments from him about Atari.

Electronic Arts has adopted a "wait and see" posture towards the new Atari STs while eagerly jumping aboard the Commodore Amiga and 128 bandwagon. I question the accuracy of his figures on the number of Atari computers and disk drives sold, I have seen authoritative higher estimates elsewhere.

Arthur Horan
Brooklyn, NY

DOUBLE QUADRUPLE

In Matthew Ratcliff's **Antic** program "Custom Print" (March, 1985) there is an option for quadruple density dot graphics on the Gemini 10X printer. Did you know the Panasonic KX-P1091 also has a quadruple density dot graphics mode? To modify Matt's program for the Panasonic, change the lower case "z" in line 320 to an upper case "Z".

Anil Prasad
London, Ontario
Canada

continued on page 8

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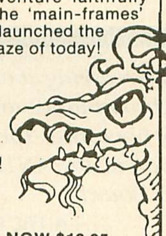
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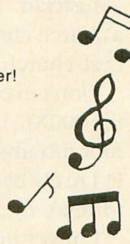
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LOTSABYTES

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i/o board

continued from page 6

BLUE MAX BLUES

A short time ago, I purchased a new 130XE computer to replace my old battle-scarred upgraded 400. But I found that when I tried to load the Synapse game **Blue Max**, I kept getting the familiar "Please Remove Cartridge" message on the screen. Even using the advice given in **Antic** about Translator, I could not get the program to load.

Marty Saletta
Dunkirk, New York

Broderbund told ***Antic*** *that of all their games,* ***Blue Max*** *and* ***Dimension X*** *are the only ones that don't load on the 130XE and they're not sure why.*
—ANTIC ED

ENCORE, ENCORE

I can't thank Angelo Giambra enough for "Musician" (**Antic**, June 1985). I sing in a church choir and now I can listen to my best church music on my Atari!

Don't ever stop printing programs for the 800XL! I bought my Atari 800XL about four months ago and am very happy with it. I really like typing in programs. It seems to relax me.

I'm getting started late at my age, (I'm 34), but someday I'll be a good programmer!

David Shatraw
Rochester, NY

Don't worry, ***Antic*** *is NOT about to turn its back on the million-plus users of 8-bit Atari computers.*—ANTIC ED

OKI MATES

Will Broderbund's **Print Shop** be coming out with a version for Okimate 10 color printers? Any similar programs that you can tell me about that will run with the Okimate would be greatly appreciated.

Timothy Dale
New Orleans, LA

As far as we have been able to find out, Broderbund does not have a color Print Shop version in the works. ***RAMbrandt*** *(Antic Catalog, AP157) has the best Okimate 10 color dump available.*—ANTIC ED

A POKE CHEER

Here's something you probably didn't know was tucked away inside your Atari.

```
10 S=53760:POKE S,230:POKE S+1,175:POKE S+2,231:POKE S+3,175:POKE S+4,229:POKE S+15,3
20 FOR X=0 TO 255.49 STEP 0.135:POKE S+8,X:NEXT X:GOTO 20
```

Lloyd Burchill
Newcastle,
New Brunswick
Canada

No, it will not format your disk.
—ANTIC ED

CHROMA I/O

Antic *received many letters asking about the 130XE's separate chrominance and luminance (XLs do not have this). These helpful responses came via the ANTIC ONLINE electronic I/O Board.*
—ANTIC ED

From Ray McGoldrick (76556,710): I found that the 130XE does support chroma output on the same pin as the old 800. It's true that the 800XL has no output to the chroma pin. But I had good results using the video output in place of the chroma output. The picture is not as good as with true chroma input, but seems to be better than the straight video. I own a computer retail store here in Alaska and have a 130XE running an Amdek color 300 monitor with the chroma and luma inputs going in right now.

From regular **Antic** author Matthew Ratcliff (75756,2710): I send the 800XL composite video to the composite chroma input at the back of a Commodore 1702 monitor. This gives a sharper picture than just using the video input at the front of the monitor. No problem.

AT YOUR SERVICE

A Long Island Atari repair facility that was on your list of Service Centers earlier this year is no longer in operation. However, Island Video Computer Service in Coram, NY is alive and well. And they did an excellent job of fixing my 1027 printer.

B.J. Freeman
Wantagh, NY

help!

PRO*TERM DOWNLOAD

Antic received several complaints from readers unable to download large binary files with Pro*Term (August, 1985).

In response, **Antic** re-tested Pro*Term on CompuServe and the program passed every test, successfully downloading several large files in XMODEM protocol, including two 412-sector binary files.

SUPRA 503

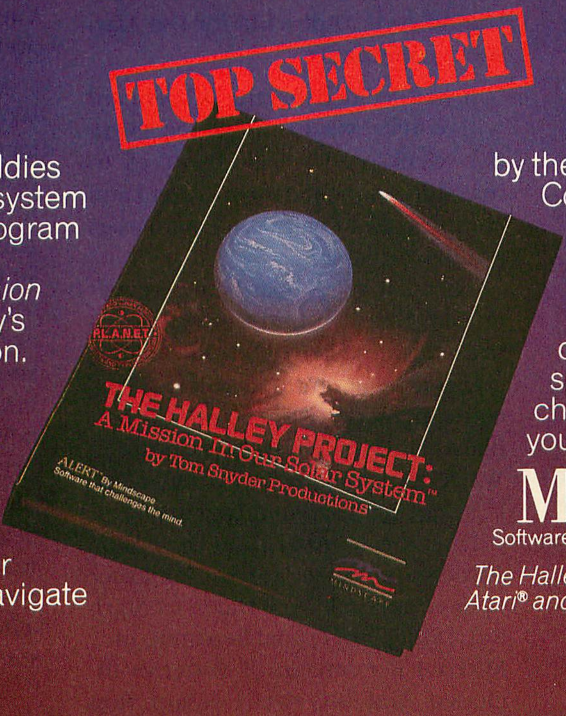
The (503) area code was misprinted in the phone numbers for Supra Corp. on the page 10 story in **Antic** last month. Supra's correct Technical Support number is (503) 967-9081. The correct number for ordering Supra products is (503) 967-9075.

ST SOUND EXTRAS

The C listing for ST Sound (November 1985) appeared with three extra garbage characters at the right end of the 11th line down from the start of the DO. . .WHILE loop on page 68. The correct line is:

```
note_lo = (x_note & lo_mask);
```

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Worldwide™ Users Network

Type GO ANTIC when you log onto **CompuServe** in November. This month on ANTIC ONLINE you'll find in-depth reports about the first meetings of the full Board of Directors of the Worldwide Users Network, including the charter slate of Atari users group representatives.

CHARTER MEETING

The opening online meeting of the WUN Board of Directors took place on August 28. Agenda topics covered were:

• WUN support commitments from corporations represented by the directors.

• Varying viewpoints from the directors about what services WUN should seek to provide for the Atari users community.

It was decided that the WUN board will confer via CompuServe every two weeks. WUN will also seek to maintain online the most current and complete list of worldwide Atari users groups available.

The next WUN board meeting was to take place in mid-September. Its main business would be to nominate and vote on users group officers to become members of the board. Current plans called for at least 10 users group WUN directors representing major U.S. and international regions.

Directors logged on for the online conference were **Antic** Publisher James Capparell, Neil Harris of Atari, Rob LaTulipe of Digital Research, Inc., Michael Reichmann of Batteries Included and SIG*Atari Sysop Ron Luks. Sig Hartmann of Atari was unable to attend due to a last-minute corporate meeting.

Chairman of the session was WUN Co-coordinator Gary Yost, Antic Catalog marketing director. Also on hand at **Antic's** terminal were WUN Co-coordinator Nat Friedland and WUN Corresponding Secretary Rebecca Hale.

WUN COMMITMENTS

Michael Reichmann from Batteries Included, the software publishing company whose products for Atari include **Paper Clip** and **HomePak**, said that BI would provide "modest financial backing" for WUN. The company also would be willing to host in-person meetings of WUN representatives in its suite at future Consumer Electronics Shows.

Rob LaTulipe from Digital Research, the company that developed the **GEM** icon desktop software for the ST computers, said that DRI saw itself as "the new kid on the block" in terms of the Atari users community. He expressed the hope that WUN could be a bridge between Atari users and Atari suppliers.

James Capparell pledged that **Antic** would continue contributing organizational effort plus online and print resources until WUN was able to stand on its own. At that point **Antic** would leave the forefront and simply participate in WUN as one of the corporate members. However, even then **Antic** will keep providing late-breaking Atari news and in-depth information online for users group newsletters to download and reprint.

If you're not a CompuServe subscriber yet, see your local computer dealer or phone (800) 848-8199 for information about signing up. Ohio residents phone (614) 457-0802. There is no extra charge for accessing ANTIC ONLINE.

BBS CRASHBUSTER

Foil those evil bulletin board crashers

by MATTHEW RATCLIFF

Bulletin board sysops can now foil destructive "crashers" with this machine language USR call. BBS Crashbuster quickly strips all non-standard ATASCII characters from input strings. The BASIC demonstration program runs on all Atari 8-bit computers, with disk or cassette. We also included the source code for non-sysop assembly language mavens.

A genuine concern for any system operator (sysop) of an electronic bulletin board (BBS) is "board crashers" who try to shut down the BBS by sending invalid string characters. (***Antic** won't encourage this destructive behavior by including any examples.*—ANTIC ED)

The Atari BASIC INPUT statement gives you very little control over the characters allowed. Most often, the sysop installs a slow FOR-NEXT loop to check a string for invalid characters before accepting it. This wastes time and precious memory.

BASIC DEMO

Listing 1 is a short BASIC demonstration program containing a machine language (ML) routine that checks your input string for invalid characters and translates them to normal ASCII printable characters.

The variable in the USR call at line 1000 (A=USR. . .) returns one of several values. A zero means that all is well and no invalid characters were in the string. A number between one and 255 is a count of the number of invalid characters that were found and corrected.

The USR routine also checks for invalid call formats. The program must have the string address followed by the string's length, which must be between one and 255. If one of these parameters is left off, or if you have too many, the ML routine will return safely to BASIC with a value of 256 in the calling variable.

TYPING IT IN

Type the BASIC listing carefully and check it with TYPO II. If you're good at typing Atari special characters, type line 1000 as is, and don't bother typing line 15 and the lines from 2000 to the end. **Antic** Disk subscribers simply type RUN "D:CRBUST.BAS" to use the program.

For those of us who don't like typing special characters, line 1000 will be created by lines 15 and 2000-etc. Should you decide to use these lines, skip line 1000 and type in the rest of the program. Check Listing 1 with TYPO II and SAVE a copy before you RUN it. Line 1000 will be printed on the screen, along with the unneeded line numbers. Move the cursor to each line number and press [RETURN]. The resulting program, consisting of lines 5 through 1010, may now be SAVEd.

When RUN, the program will prompt you to enter a string. It will then print the converted invalid characters in L$ and the total number of these "garbage" characters.

This routine should save budding sysops a lot of headaches with would-be crashers. But also, if you are writing any type of program that expects normal keyboard inputs, this routine can quickly clean up your strings.

Listing 2 is the assembly language source code. Disk subscribers will find it on the monthly disk as CRBUST.M65. It need not be typed in, but you will require the MAC/65 assembler cartridge if you wish to modify it. The source code can be easily modified for different types of translations. For example, you can also check for lower case characters and convert them directly to upper case.

*Matthew Ratcliff is one of **Antic's** most dependable high-level programmers.*

Listing on page 92

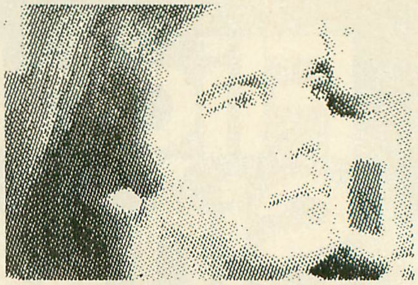


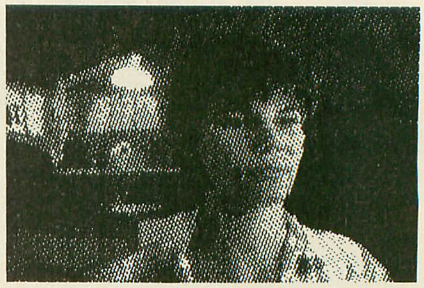
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VIDEO STAR ATARI

Computereyes . . . plus other new graphics goodies

by CHARLES JACKSON, **Antic** Program Editor









One week after **Computereyes** arrived at **Antic**, we finally put away our videocamera long enough to start writing a review.

Digitizing images with your Atari has never been simpler—or more fun. Aim your camera, press a key, and Computereyes does the rest. Within a minute or so, the digitized image appears on your video screen, ready to be SAVEd to your disk as a 62-sector picture file.

To use the Computereyes system effectively, you need a standard video camera. Or you can buy Digital Vision's $399.95 version that includes a basic b&w camera.

Although Computereyes accepts any type of video signal, **Antic** was able to produce much better images with a videocamera than by using "freeze-frame" on a videocassette recorder.

Digital Vision president Dave Pratt told us that many people have successfully used Computereyes with the new 4-head and 8-head VCRs. These models produce cleaner freeze-frame signals than older VCRs we had available for testing as of this writing.

The Computereyes interface is a black plastic box about the size of an Atari power supply. It has two cables that plug into joystick ports 1 and 2, plus a female RCA jack which accepts the incoming video signal cable. It also has two knobs that control the video signal brightness and synchronization rate.

Computereyes software supports five different digitizing "capture" modes. Three of these formats use Graphics Mode 8, the remaining two use ANTIC Mode E (Graphics 7 1/2). Image capture times range from 7 to 52 seconds, depending on the mode.

The 4-Level and 8-Level captures produce "textured" images which reproduce well on dot-matrix printers.

A 16-level GTIA capture mode using Graphics 9 will soon be available for about $15, said Digital Vision's Pratt, "It will be a software enhancement available on a separate disk."

Pratt added that he would have brought out the Atari version of Computereyes much sooner if he had realized how fast sales would take off, compared to the earlier Commodore and Apple II editions. "Atari users seem to be heavily into graphics and video," he noted.

COMPUTEREYES



ANTIC CONNECTIONS

Computereyes programmer Jim Bergman is working on a new version that will save images in KoalaPad format. Until then, you can use Rapid Graphics Converter from the November, 1985 **Antic** to adapt your Computereyes pictures to Micro Illustrator format (KoalaPad, Atari Touch Tablet or Light Pen, etc.). To fade between Computereyes images in a flashy video slide show, use Fader II (**Antic**, May 1985).

And to convert your final digitized video image into a Print Shop file for making letterheads and greeting cards, use Graphic Shop (see following review).

Samples of the images made by **Antic** during our week of obsession with Computereyes are in SIG*Atari, on CompuServe or Delphi. On CompuServe, goto to DL4 and download GIGI.XMO, JULIA.BIN, and NAT.XMO. These images of **Antic** staff members were recorded with Computereyes, then converted with the Rapid Graphics Converter for manipulation in KoalaPad format.

For a sample Computereyes Print Shop graphic in SIG*Atari DL4, see STEVE.XMO. The image was created in Normal Capture mode, then converted into a Print Shop graphic with Graphic Shop.

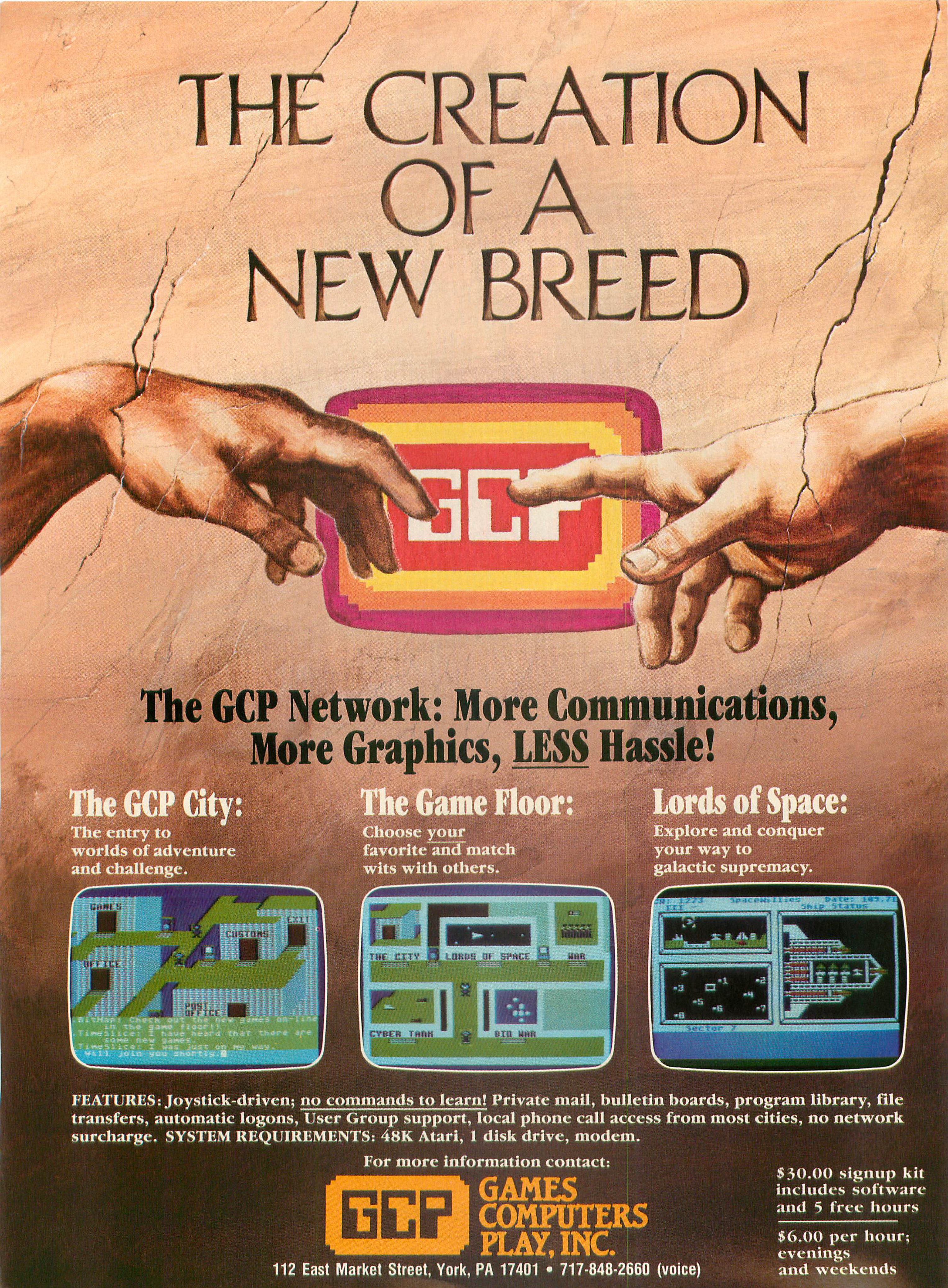
DRAWBACKS

Computereyes has some minor flaws. First, the program is inconvenient to operate. There's no practical way to preview your image before you digitize it. You must keep plugging and unplugging your camera between the monitor and the interface in order to set up a shot and digitize it.

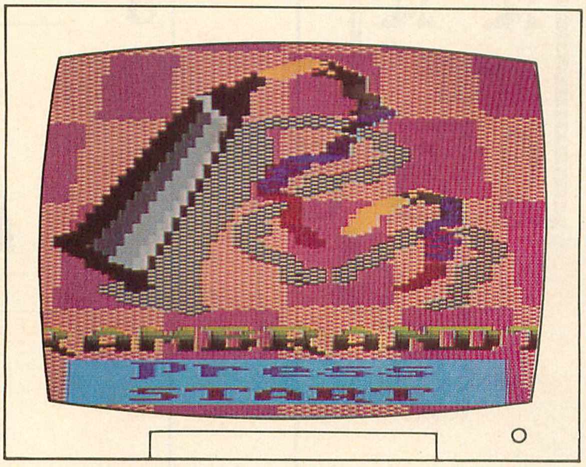
Computereyes is also comparatively expensive, especially if you don't already own a videocamera. For $399.95, you could easily buy a new 130XE computer and a disk drive. Although Computereyes might be beyond a casual user's budget, it would be a great investment for user groups, businesses and schools.

COMPUTEREYES
Digital Vision, Inc.
14 Oak Street, Suite 2
Needham, MA 02192
(617) 444-9040
$129.95, 48K disk
($399.95 with camera)

continued on page 17


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VIDEO STAR ATARI
continued from page 15



RAMBRANDT

RAMbrandt, by Bard Ermentrout, is a powerful drawing program that belongs in the paintbox of every serious electronic artist.

The program offers a grand array of tools you can use to create and modify pictures in Graphics Mode 7, Graphics 7 1/2 (ANTIC Mode E) and all three GTIA modes.

RAMbrandt boasts a host of spectacular functions which can't be found in any other drawing program. Its Windowing function can magnify and reduce screen objects, flip them horizontally or vertically, rotate them in five-degree increments, even *animate* them.

RAMbrandt's animation function lets you create and animate short scenes, then view them in a small window. Used with GR. 7, RAMbrandt's Animation can even be used to enhance Moviemaker (Reston) background files.

RAMbrandt has more than six dozen commands. These include user-defined brushes and texture fills, airbrushing, "rubber band" ellipse, circle and box modes, transparent overlays, cut-and-paste windows which can be scaled in size, an "Exclusive-OR" brush, a color-oriented "search-and-replace" brush, mixture of text and graphics, and many, many more.

RAMbrandt can also SAVE and LOAD Micro-Painter and Micro Illustrator (KoalaPad, etc.) files.

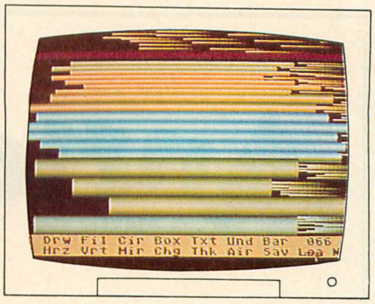
RAMbrandt is written in Forth, which means that disk access and pattern fills are considerably slower than similar functions found in machine-language drawing programs.

Also the program has some trouble LOADing Koala pictures, completing certain user-defined pattern fills, and handling user-defined functions from the touchpad mode.

One of RAMbrandt's nicest features is the UNDO command. This lifesaver erases the last graphic command you entered. If you put a pattern fill in the wrong place, if a line isn't straight, or if you accidentally erased a piece of your screen, UNDO corrects the damage.

RAMbrandt is a command-driven program which does not have the colorful, happy menu icons prevalent in simpler drawing programs. It is not a toy. It is made for the serious computer artist who wants more powerul graphics software. Although casual artists may find the program "too hard" to use, serious microscreen artists will find RAMbrandt a powerful and invaluable graphics tool.

RAMBRANDT
Antic Catalog
AP157
$19.95, 48K disk



BASIC TO MICRO ILLUSTRATOR
Bonus Disk Images

Antic Disk subscribers have an unusual bonus this month! We put several of our favorite Computereyes images on this month's disk in Micro Illustrator format.

In case you don't own Micro Illustrator software (It's provided with most touch tablets and light pens), we've also included VIEW.BAS, a short BASIC program that decompresses and displays pictures created with Micro Illustrator.

VIEW.BAS runs on all 8-bit Atari computers. It is printed in the current issue's type-in listing section as well as being on the monthly disk. If you type VIEW.BAS, check it with TYPO II and SAVE a copy before you RUN it.

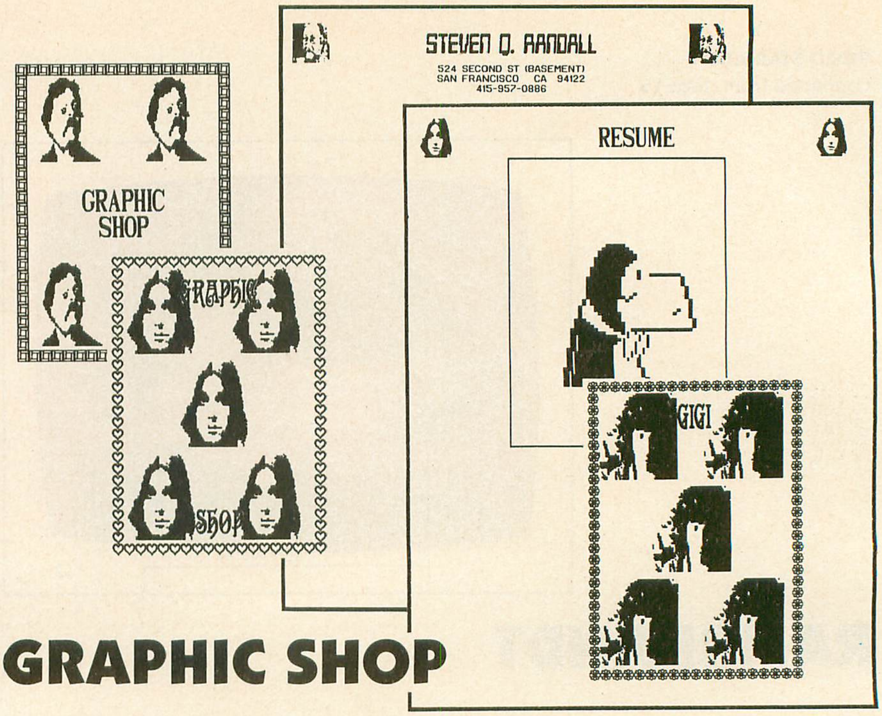
HOW IT WORKS

To load a Micro Illustrator picture, RUN the program, then enter the picture's filename. VIEW.BAS does the rest.

The USR call in line 210 changes a GRAPHICS 8+16 (ANTIC Mode F) display list into an ANTIC Mode E display list. The USR call in line 230 decompresses and displays the picture file. This USR call uses a machine language routine stored in MAIN$, and a routine stored in Page 6. The latter routine is POKEd into memory in lines 100-130.—CJ

Listing on page 93

continued on next page



GRAPHIC SHOP

Yes, I co-wrote this program with Darryl May. But just so you don't think this review is biased, I'll be careful not to tell you whether or not I think **Graphic Shop** is any good. I'll just describe what it does.

Graphic Shop can take any picture created with Micro-Painter or Micro Illustrator (KoalaPad, Atari Touch Tablet or Light Pen, etc.) and turn all of it—or any section of it—into a graphic that can be SAVEd to a Print Shop disk.

You can also use the program to format Print Shop data disks and to view directories of DOS 2 or Print Shop data disks.

Graphic Shop was designed to be as easy to use as Print Shop. Both use the same type of menus, and both can be used without reading many pages of instructions.

From the Main Menu, you can load KoalaPad or Micro-Painter pictures, view disk directories, or create specially-formatted Print Shop data disks.

Once a picture is loaded, you can convert your picture in one of two ways:

1. You can use your joystick to position a small, blinking frame over a portion of your picture and convert only that portion.

2. You can compress the entire screen into a Print Shop graphic.

Because Print Shop does not support high-resolution graphics, some of the finer details of your microscreen may be lost when you use the second option. This option takes longer than the first because it is squeezing more than 7,000 bytes into less than 600 bytes.

Graphic Shop translates your four-color microscreens into two-color Print Shop graphics by using black fills and white fills for two of your microscreen's color registers, and pattern fills for the two remaining color registers.

Next, a four-window Preview Screen lets you decide which parts of your picture will receive pattern fills, and which parts will be solid. Choose the image you like best, and Graphic Shop will save it to your Print Shop data disk.

If you don't like any of the conversions, you can return to your picture and try again.

Graphic Shop also has a "smart" disk directory routine. The program determines whether a Print Shop disk or a DOS 2 disk is in drive 1, and then displays the appropriate directory.

GRAPHIC SHOP
Antic Catalog
AP156
$19.95, 48K disk

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- Do a complete Hi-Res scan in under 6 seconds
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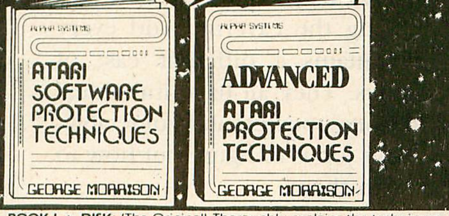
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NEW LUCASFILM GAMES:

Antic's Sneak Preview— — The Eidolon and Koronis Rift

by JACK POWELL, **Antic** Technical Editor

Here's an **Antic** sneak preview of the latest Lucasfilm Computer Games—two impressive new releases, **The Eidolon** and **Koronis Rift**. By the time you read this, they should be available from Epyx Software, 1043 Kiel Court, Sunnyvale, CA 94089. (408) 745-0700.

BEHIND THE SCENES

One sunny summer day, **Antic** arrived at Lucasfilm's Marin County industrial park and was led through labyrinthian corridors to the Computer Games Division.

On the way, we passed through The Droid Works, a Lucasfilm spin-off company, and glimpsed the state-of-the-art computerized video/film editing machine. Two of the machine's three screens showed Luke Skywalker bending over a dying Yoda.

Twisting up one stairway, down two, and through several corridors we came at last to a room filled with microcomputers and monitors of every shape and type. IBM PCs, Apples, Commodores and—of course—Ataris.

While waiting for the programmers to arrive, our guide Julia McHugh showed us an adjoining room filled with coin-op arcade game machines, including such rarities as The Empire Strikes Back, and Return of the Jedi featuring the jetbike forest chase. Lucasfilm management cannily offers a creative, meditative oasis from hours of intensive programming—thereby encouraging further creativity.

THE EIDOLON

Exploring an old abandoned house, you come upon a dusty, faded diary belonging to a 19th century crackpot inventor. The diary is stained and difficult to read, but you make out references to a strange machine and many journeys through an alternate world of caverns and monsters. You really don't learn much from the vague, cryptic passages. And the diary ends abruptly and ominously, with a hint that its author never made it back from his last sojourn.

Wandering further, you come upon the machine itself—looking very much like a George Pal creation. Being a reckless, adventuresome sort, you hop into the machine, pressing buttons and throwing levers until, with a click and a whir, you suddenly find yourself in. . . .

A huge maze of gray caverns is where the game really begins. The caverns are generated by fractals and, as you wander, the stalactites and arches move overhead much like the mountains and landscape of Rescue on Fractalus.

As you journey through the caves, you see flickering fireballs and mystical, floating gems. In certain grottoes are statues of odd, mishapen creatures. You draw near one particularly repulsive beast and suddenly it changes color, comes to life and begins pursuing you!

3-D FANTASY

As conceived by Project Leader Charlie Kellner, The Eidolon is a point-of-view fantasy· role-playing game with ten levels of complex mazes. Your goal is to find a dragon on each level and figure out how to vanquish it to get to the next level.

Kellner told us that a large part of the game's challenge is figuring out the rules of this strange world. The documentation will be purposely ambiguous—and **Antic** isn't going to spoil the fun by giving away details.

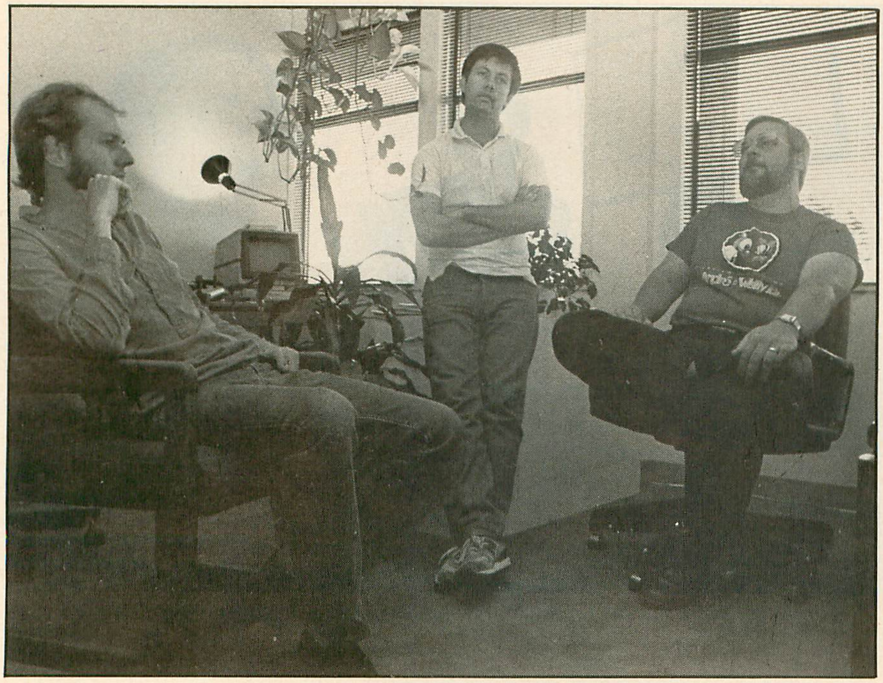
We can tell you that there are a lot of marvelously animated creatures populating the caverns. And every level contains a different cast of characters. They all have individual intelligences, powers and vulnerabilities. Your job is to figure out how to deal with them.

EIDOLON TEAM

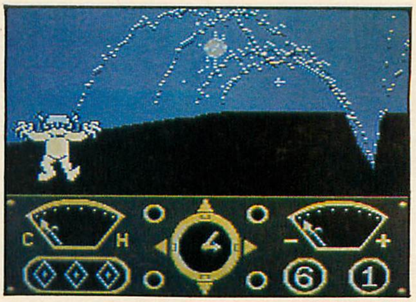
Project Leader Kellner was responsible for some of the sound and the flight dynamics in **Rescue on Fractalus**. (See **Antic**, August 1984.) Before coming to Lucasfilm, he worked at Apple in the Education Department.

He began to realize the real way to educate was with game technology—teaching by computer-created simulations. "After all, a physics lab is nothing more than a simulation, and this can be done on a computer."

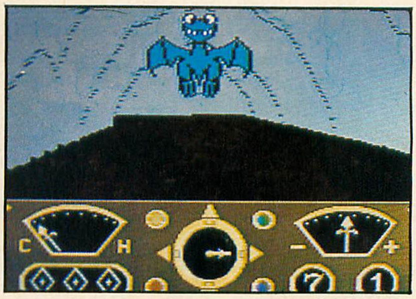
He'd always been interested in games, both as a designer and a player.



Eidolon programmers (from left) Douglas Crockford, Gary Winnick and Charlie Kellner.



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But he didn't have much opportunity to do this at Apple. "I discovered 2 1/2 years ago that George Lucas was starting up a game division and . . . that was it."

If you've ever been attacked by the Jaggi Monster in Rescue on Fractalus, you've seen the work of Gary Winnick. He is also responsible for the Lucasfilm title logo and the introduction animation in **Ballblazer**. (See **Antic**, August 1984.) For The Eidolon, Winnick is in charge of graphics, plus the design and animation of all the creatures.

Winnick began as a commercial artist with an interest in animation and film. "When computers came along, I bought an Atari and started fooling around with it." It wasn't long before he was working at Atari. He and Charlie Kellner became friends, and in a short time Winnick found himself at Lucasfilm. "It all happened real fast."

Kevin Furry is converting the game to the Commodore 64 in parallel development. The original code for The Eidolon is written on a VAX minicomputer before the graphics are separately designed on the two target computers.

Furry developed graphics hardware and software packages for the Mindset computer. "My brother bought a Commodore. Like any programmer, you can't keep your hands off the toy at home."

The fourth member of The Eidolon team is a familiar name to **Antic** readers: Douglas Crockford, creator of **Galahad and the Holy Grail**, **Burgers!** and other games available through the Antic Arcade Catalog.

Crockford is developing sound and music for The Edidolon. He also developed a technique permitting full screen animation during disk access. This technique is being used in both new games and can be seen in action during the introductions to Ballblazer and Rescue on Fractalus.

Crockford was invited to the Atari Research division by Chris Crawford, who was impressed with Galahad. Before coming to Lucasfilm, he worked briefly for National Semiconductor.

A.C.E.

One of the most fascinating elements in The Eidolon is the huge collection of animated creatures which populate the underground world. **Antic** was shown the design utility program which makes this new technique possible.

Tentatively named A.C.E. (Animated Cel Editor), the program was written by Charlie Kellner and is used by Gary Winnick to design and animate the creatures. It's based on the classic animation technique where moving parts of a character are inked on transparent cels (short for celluloid sheets). Several layers of cels make up one image which is animated by moving the cels.

To demonstrate this on A.C.E., a dragon was brought to the screen. An animation window was assigned to each of its main parts—head, wings, tail, etc. When the animation cycle of the neck window was run, the neck snaked around in a circular path. The head—in a separate window—rolled its eyes and opened its mouth. By then attaching the head window to the neck window, the growling head followed the circular path of the neck. In this way, detailed creatures with complex, bit-mapped animation can roam freely about the caverns.

Winnick showed off an A.C.E. rogues gallery of trolls, orcs, and other oddities. The creatures are distinctly cartoon-like and substantially bigger than any seen in previous microcomputer games.

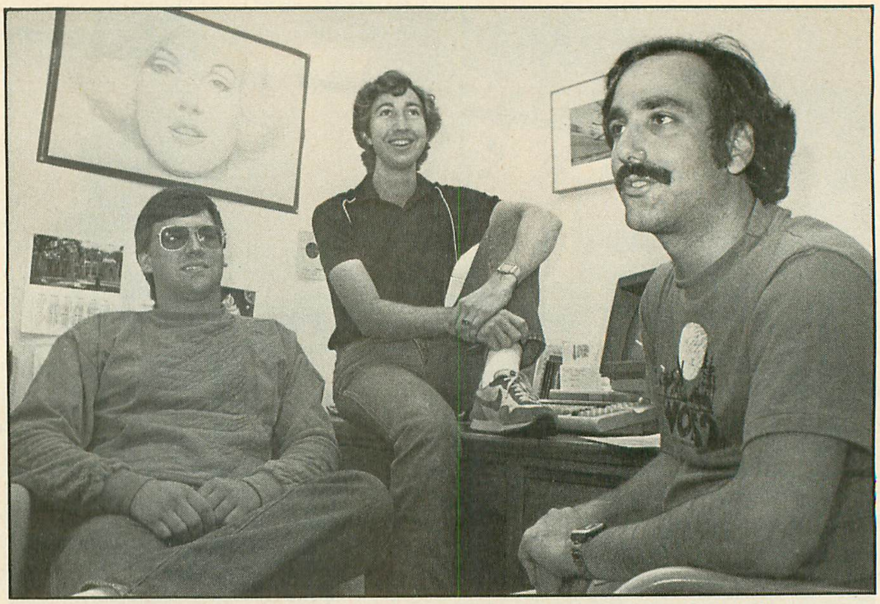
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Koronis Rift programmers (from left) Ron Gilbert, Aric Wilmunder, Noah Falstein.

Photography Linda Tapscott

KORONIS RIFT

You're a down-and-out techno scavenger in the year 2049, exploring the Koronis Rift. When the Ancients abandoned this mountainous planet, they left behind priceless artifacts of their superior weapons technology. They also left behind a race of mean, trigger-happy saucer people.

If you can collect enough weapon system artifacts—and figure out how to use them—you're a made man. If the saucers get you, you're a dead man.

You travel the fractal landscape of the planet in your surface rover. When you come upon an ancient hulk, you send your droid out to retrieve the weapon system inside. You may be able to put the system to immediate use against those pesky saucers which, even now, are attacking with multi-colored lasers.

After filling your craft with weapon systems, return to your scout craft and run the collected systems by your science droid for instant analysis—assuming he can figure them out!

STRATEGIC SHOOT-UP

Noah Falstein is Project Leader and main designer of Koronis Rift, which he describes as a strategy game in an action format. "On a primary level, it's a standard shoot'em-up. Someone who likes that sort of thing can jump in there, blow up anything that moves and have a good time."

But on another level, Koronis Rift is a multi-layered strategy game where colors and shapes are important clues to the function of the collected weapon systems. A red laser may work fine against a blue saucer, but may be worthless against a yellow one.

Game documentation will contain descriptions of the various planetary cultures and the icons representing them. Since you can identify the race that developed a weapon system by the shape of the hulk, this may give you a clue to its function. Your science droid may be able to help you—or you might just have to try the system and see what it does.

There are many different types of weapon systems with varying properties and power requirements. One may help you past a rough part of the landscape by blowing up a mountain —but will completely drain your shield power!

The landscape of Koronis looks similar to Fractalus, but with higher mountains. A new programming technique blends fractals and GTIA Mode 9 to create an illusion of misty depth much like classic Japanese paintings.

KORONIS TEAM

Project leader Noah Falstein began his computer gaming career when a college professor recommended him to the electronics division at Milton Bradley. After 2 1/2 years there—during which every project he worked on was cancelled—he moved on to Williams Electronics in Chicago where he worked on arcade game design. He came to Lucasfilm when Ballblazer and Rescue on Fractalus were in their final stages of development.

Aric Wilmunder is called the "speed demon" of the Koronis team. Wilmunder is responsible for refining and speeding up the game's routines and designing the explosions and scaling routines for the saucers and droids. He spent 2 1/2 years at Automatic Simulations—now EPYX. Wilmunder also worked for one year with Doug Crockford at Atari Research and another year at Atari's Coin-Op division.

Ron Gilbert is converting the game to the Commodore 64. Prior to Lucasfilm, he was with Human En-

gineering Software. Additionally, he and Wilmunder have been working on speeding up the frame rates of Koronis to make it more lively for the action gamer.

Gary Winnick of the Eidolon team is also working on Koronis, designing the shapes of the saucers and the artifact hulks.

Doug Crockford is designing sound for both games. When we saw Koronis Rift, a randomly generated snare drum gave the game a military feel. "Charlie needs a dragon that sounds like a walrus, and Noah needs a robot that sounds like a walrus. It saves a lot of time."

Jim St. Louis is an artist as well as a programmer. He's probably best known in the Atari community as the co-creator—with Russ Karas—of the Robot and Rocketship graphics demos released by Atari.

St. Louis also created a robot—the science droid—for Koronis Rift. And his incredibly detailed rocketship animates the title screen of Rescue on Fractalus. Prior to joining Lucasfilm, St. Louis worked on computer graphics at Datamost and Disney T.N.T.

WHAT'S NEXT?

As we left the Lucasfilm complex—our eyes blinking in the bright, summer sunlight—we thought about our parting conversation with Steve Arnold, Director of the Games Division.

We had noticed among Lucasfilm personnel much use of the phrase "interactive entertainment." So we asked what new projects were in the works from the Marin magic factory. Arnold told us that specific projects could not be discussed at this time. He then added, with a cheshire grin, "There are significant new kinds of experiences available for bringing together computer and film . . ."

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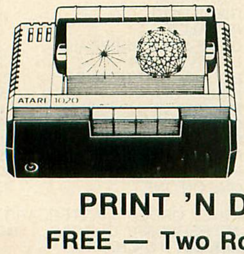
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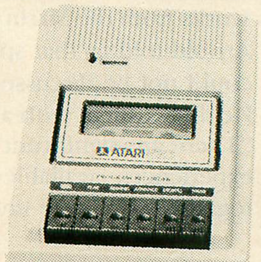
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DISKIO PLUS

Antic super-utility now even better

by PATRICK DELL'ERA

This spectacular update of the original DISKIO disk operation utility provides instant, one-dot keystroke commands for nearly all DOS functions, an alphabetized disk directory, single-key macros and much more. All without touching your resident program. Works with BASIC, BASIC XL/XE, MAC/65 (cartridge only), or Atari Assembler Editor. DISKIO PLUS is compatible with DOS 2, DOS 2.5, DOS XL and will work with single or enhanced density. It also works with all 8-BIT Atari computers—including the 130XE.

Last January, ***Antic*** *published one of our most popular and useful programs—DISKIO by Dr. Bernard Oppenheim. It was a resident disk file utility that permitted most disk operations to be accessed directly from BASIC or Atari Assembler Editor with quick, one-dot commands. DISKIO instantly became our in-house utility and generated a great deal of appreciative mail. But when DOS 2.5 appeared, it became evident that DISKIO needed an update since it didn't work with the new DOS.*

Antic *contacted Dr. Oppenheim, who is a nuclear medicine physician. Though he was unable to find time in his busy schedule to rewrite the program, he generously sent us his source code which we immediately passed on to Patrick Dell'Era. Patrick—who will be remembered for his* ***Antic*** *enhancements of Price's Painter (April 1985) and Fader (May 1985)—set to work and created the following, incredible DISKIO PLUS. Yes, it works with DOS 2.5. But a lot of new bells and whistles have been added.* —ANTIC ED)

Okay, throw out your DUP.SYS. You're not going to need it anymore. DISKIO PLUS will take care of just about any disk function you can think of. And you won't have to go to DOS to do it.

THREE LISTINGS

Before we get heavily into all the new things DISKIO PLUS can do, let's take care of those who already have DISKIO and just want to get it working with DOS 2.5.

Type in Listing 3, DSKIOFIX.BAS, check it with TYPO II, and SAVE a copy before you RUN it. This short BASIC program will alter a few bytes in your original DISKIO AUTORUN.SYS file and make it work with DOS 2.5 as well as DOS 2. If you're happy with DISKIO as is, you can stop reading right here. But if you want the full package of extras—like multiple file moves, wild cards, macros, BASIC XL/XE and MAC/65 compatibility—read on.

Still with us? Listing 1, DSKIOMAK.BAS, creates DISKIO PLUS. It's a lot of typing, but worth it. Type it in *very* carefully, check it with TYPO II and SAVE a copy. All that data is machine language and every number must be absolutely correct.

When you RUN Listing 1, it will count the data statements to make sure you have the right total. Then it will ask you to specify a filename. If you're using Atari DOS,

call your file AUTORUN.SYS. DOS XL users should name theirs STARTUP.EXC.

Next you're asked if you want your DISKIO PLUS for BASIC or assembly language. Choose your favorite language and the program will create a binary file of 30 sectors. (That's right, it's a little longer than the original. DISKIO eats 3129 bytes of RAM while DISKIO PLUS gobbles 3408.)

Listing 2, KEYMAC.BAS, is a special utility which will be described later. You don't need to type it in to make DISKIO PLUS work.

Antic Disk subscribers will find all three of the above listings on their monthly disk, under the filenames previously mentioned.

DOT COMMANDS

There are a lot of options and commands with DISKIO PLUS. Maybe a little scenario will clarify things.

You decide to do a bit of programming in BASIC, so you boot your disk containing DISKIO PLUS in the form of an AUTORUN.SYS file. (Note: the assembly-language version of DISKIO PLUS operates identically to the BASIC version with the exception of using the [#] for file access).

A brief title screen appears to let you know DISKIO PLUS is installed, then the READY prompt pops into place.

You want to see what files are on the disk, so you type **DIR** [RETURN], and the DIRectory of drive 1 appears with all the files in alphabetical order, looking something like this:

```
 1 AUTORUN  SYS 030    5 MYMAC    KEY 001
 2 BIFFIII  BAS 057    6 RAMDISK  COM 009
 3 DOS      SYS 074    7 SAMPLE   BAS 014
 4 DUP      SYS 042    8 WORDTREEOBJ  001
479 FREE SECTORS
```

Notice the numbers immediately before each file. These are "file reference numbers" and are used by the DISKIO PLUS "one-dot" commands.

What's a one-dot command? Let's say you have decided to delete the file called SAMPLE.BAS. Since it has a reference number of 7, you type: **.D7**. A prompt will appear to make sure you really want to do this. Answer the prompt by pressing [Y], and the file will be deleted.

Want to LOAD a file? Type **.L2**. You can rename a file by typing:

.N2,NEWFILE [RETURN].

How about moving a file from drive 1 to drive 2? Type **.M6/2**. And for you jaded DISKIO users who have seen most of this stuff, how about wild-card *multiple* file moves? Type **.M*.*/2** to move all files from drive 1 to drive 2.

And—oh yes—that BASIC program you LOADed is still in memory—untouched and ready to examine.

COMMAND STRUCTURE

At first there may seem to be a lot of combinations here. But once you get used to the structure of DISKIO PLUS commands, you'll find them to be automatic, natural, and very fast. In most cases, the commands use an identical pattern with only one different letter to differentiate the command.

Let's examine all the possibilities with only one command; the command to locK (protect) a file:

.K [n] [filename] [device:filename]

The first, and most important, character is the period—or dot. This tells the computer that a DISKIO PLUS command is coming. Next is the letter signifying the type of command—in this case K, for locK.

The square brackets indicate optional parameters. They are *not* part of the DISKIO PLUS command.

You can reference the file you wish to locK in three ways. The first optional parameter is n, which stands for file reference number. If the directory is showing on the screen, you may use the file reference number as: **.K4**. This will locK file number four. Remember, the directory must be on the screen in order to use file reference numbers.

The second set of brackets shows we may alternatively type in the filename: **.KMYFILE.BAS**. Notice there is no space between the command letter and the file name.

Should we wish to locK a file in a drive other than the default drive, we can also use the device:

.KD2:MYFILE.BAS.

This example will locK MYFILE.BAS on the second drive.

Wild cards [*] may be used with the second and third options. You can locK all the files by typing **.K*.***.

HELP

All of the DISKIO PLUS dot commands work the same as locK, with the exception of some which have a few extra possibilities. If you forget a particular command, type **HELP** and the following menu will appear:

.N = RENAME	.M = MOVE
.D = DELETE	FORMAT
.K = LOCK	DIR
.U = UNLOCK	OFF
.X = LIST	ON
.S = SAVE	LIST
.E = ENTER	WDOS
.L = LOAD	DEF1
.R = RUN	DEF2
.B = BINARY LOAD	DEF3

Let's go through the commands one by one.

DIRECTORY

Notice there are two types of commands—one-dot commands and "word" commands. The most used word command is **DIR**.

continued on page 65

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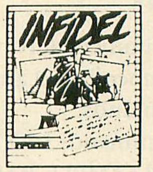
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FOURTH ANNUAL ANTIC

SHOPPERS GUIDE

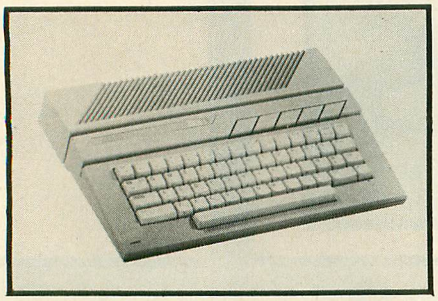
*This has been a year of exciting changes in the Atari marketplace. Here's **Antic's** selection of over 100 best products—of every type—available for Atari computers during the 1985 holiday season.*

by GIGI BISSON
***Antic** Assistant Editor*
with
NAT FRIEDLAND
and
JACK POWELL
*of the **Antic** Staff*

*In certain widespread categories, such as printers, modems and video monitors, so many makes and models are compatible with the Atari that we cannot possibly test every product on the market. The **Antic** picks in these categories are the best of these products with which we have had first-hand experience.*

HARDWARE

8-bit COMPUTERS

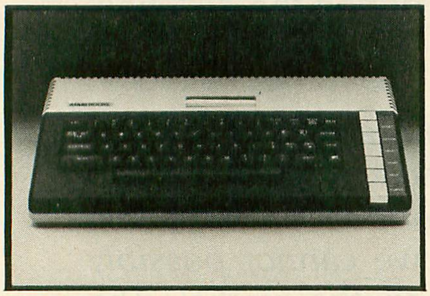


ATARI 130XE

The 130XE showed up in stores this spring without any fanfare. It has been selling fast—at prices as low as $119.97—and customers are more than satisfied. With twice as much memory as the 800XL, this 128K computer is capable of running "serious" productivity software without any compromise.

Yet the 130XE is totally upward-compatible with all the rest of Atari's 8-bit computers (no other company has ever maintained such compatibility) and the sleek new keyboard is a joy to operate. A computer this good, selling for less than what the 800XL cost in 1984, would have been simply unimaginable 18 months ago.

$149.95



ATARI 800XL

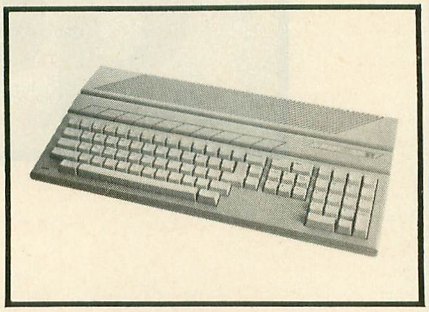
It's hard to believe that the 800XL—along with the legendary 800 the best 64K personal computer ever made—is now selling for less than $100 and no longer is in production. If Atari continues to market a low-priced 64K computer in the U.S., it will be same 65XE model which is available in Canada and overseas. However, the 800XL is still a fine choice for first-time computer buyers in 1985, with its solid base of good software and self-teaching books.

$99.95

16-bit COMPUTERS

ATARI 520ST

Here is the future of Atari. The 520ST arrived in July with 512K memory, a 360K, 3 1/2-inch disk drive, a color monitor, a two-button mouse and the GEM icon-driven operating interface, and a choice



between 640x400 monochrome monitor or a 512-color RGB monitor. This computer package costs *less* than a stripped-down 64K Apple IIe.

There has never been a personal computer as powerful as the 520ST available at anywhere near the below-$1,000 price. The ST series is driven by the same Motorola 68000 microchip used in the Macintosh, the high-powered 68000 runs on the ST at a speed of 8Mhz (eight million cycles per second). The ST's built-in interfaces include RS-232 serial, Centronics parallel, MIDI and three types of video input. The keyboard is controlled by its own microprocessor and includes a 10-key pad, one-touch cursor section, 10 programmable function keys and an UNDO key.

$799.95 with monochrome monitor
$999.95 with color monitor

260STM, 260STFM

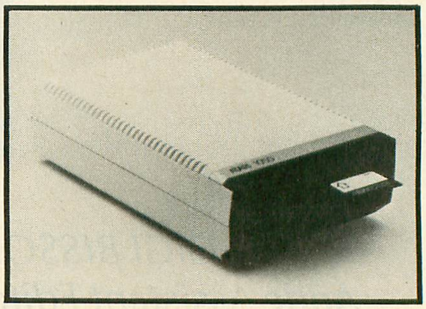
At this writing, Atari says it is still planning an October release of the 260ST model announced at the June Consumer Electronics Show. The 260STM ($399.95) was to have 256K memory. It would sell without a monitor, and a television RF modulator would be built-in. GEM would be in memory-conserving ROM chips instead of on disk. (Atari has promised that 520ST owners will be able to obtain the finalized GEM on simple plug-in chips at "nominal cost.") A 260STFM model was to include a built-in 3 1/2-inch disk drive and sell for $499.95.

Atari Corporation, 1196 Borregas Avenue, Sunnyvale, CA 94086 (408) 745-2000

(Model numbers and prices of Atari Corp. products described in this Shoppers Guide may be subject to change.)

See the ST SECTION in this issue for the Shoppers Guide to ST Peripherals and Software.

disk drives



ATARI 1050

This dependable "no frills" drive simply reads and writes disks, with no digital readouts, no printer ports, no on-board bells and whistles. But it is a proven reliable performer that does the job well, supports single and enhanced density and is immediately compatible with all Atari software. Comes with well-programmed DOS 2.5 disk operating system.

$199.95. Atari Corp., 1196 Borregas Avenue, Sunnyvale, CA 94086. (408) 745-2000.

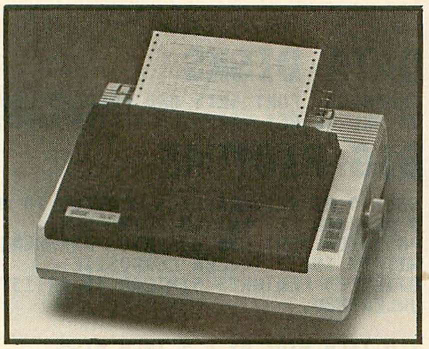


INDUS GT

Indus has reduced the price of the "Mercedes" of Atari drives. This reliable disk drive has a sexy, high-tech look and has been recently enhanced with Syncromesh, a DOS that runs it faster than ever. The front panel flaunts a flashing digital display and four control buttons. Whisper quiet, the Indus supports single, enhanced and double density and comes in a compact carrying case that converts to a disk library. You also get software including DOS XL, a simple word processor and a spreadsheet.

$324.95. Indus Systems, 9304 Deering Avenue, Chatsworth, CA 91311. (818) 882-9600.

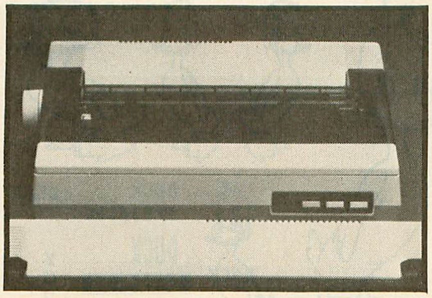
PRINTERS



STAR SG-10

Offering both speedy draft quality and great-looking "near letter quality," the SG-10 dot-matrix printer is a worthy successor to Star's deservedly popular Gemini 10X. Antic has successfully used the SG-10 with AtariWriter, PaperClip, HomePak, Letter Perfect, Print Shop, and every program from our March 1985 Printer Issue. We also use the "near letter quality" mode to prepare all the program listings in the magazine. Sold for much less than the list price at many outlets. Interface required.

$299.99. Star Micronics, Inc. 200 Park Avenue, New York, NY 10166. (212) 986-6770.



EPSON DX-10

Don't let the low price fool you. Epson's first daisy wheel printer offers true letter-quality for the masses. It's no speed demon at 10 characters per second and it doesn't come with a tractor feed. But the DX-10 is a real value breakthrough with excellent type quality and costly features like boldface, underlining, superscript, subscript and easily changed cartridge ribbon. Interface required.

$299. Epson America, Inc., 2780 Lomita Boulevard, Torrance, CA 90505. (213) 539-9140.

C. ITOH 8510 SEP+

A fast dot-matrix printer that's built like a tank, for years of heavy business or academic use. The "near letter quality" type is bold and clear—about what you'd get on a manual typewriter with a cloth ribbon. Speedy 180 cps at draft mode, full ASCII character set with true descenders, subscript, superscript, underlining, friction and tractor feed. Interface required.

$549. C. Itoh Digital Products, Inc., 1011 Francisco Street, Torrance, CA 90502. (213) 327-5939.

ATARI XDM121, ATARI XMM801

As **Antic** went to press, Atari told us that two new printers for the 8-bit computer line would arrive in October. The $229.95 letter quality XDM121 is a daisy wheel printer. The $199.95 XMM804 dot-matrix model supports graphics and prints 80 characters per second. Either model uses the Atari's regular SIO connectors and will daisychain with disk drives.

Atari Corp., 1196 Borregas Avenue, Sunnyvale, CA 94086. (408) 745-2000.

COLOR PRINTERS

OKIMATE 10

The Okimate 10 is a small, quiet and inexpensive thermal printer that prints 8" x 5 1/4" color images on single sheet or tractor feed paper. It comes with a slow, poorly designed BASIC program that will make color printouts from most Micro Illustrator files, if you have an XL/XE computer with 48K memory and DOS 2.



However, the way to get truly impressive color printouts from the Oki is to use **RAMbrandt** software ($19.95, Antic Catalog, AP157) and coated ink-jet paper.

$208 including Atari interface. Okidata Corp., 532 Fellowship Road, Mt. Laurel, NJ 08054. (609) 235-2600.

MONITORS

COMMODORE 1702

Yes, it's a first. You are actually seeing **Antic** Magazine recommend a product from Atari's arch-rival. Until arrival of Atari's long-promised line of $150 monitors, the popular Commodore 1702 may

continued on page 33

MTS SOFTWARE GAZETTE

VOL.1 NO.1 **MTS INTRODUCES THEIR HI-RES GRAPHICS SERIES!** WINTER 1985

ARTIST UNLEASHED

This is the first program in MTS's new Hi-Res Graphics Series. With it you can create graphics or write text anywhere on the graphics 8 screen.

Features:
* Enlarge/Reduce * Move * Copy
* Merge * Rotate * Reverse * Invert
* Inverse Video * Turn upside down
* Save any section of screen * Erase
* Print out 3 sizes * Change colors

The program also includes:
* REFINE - lets you blow up images so you can refine them.
* SHOW - lets you see what is on your data disk and view the graphics.
* CHARACTER GENERATORS!

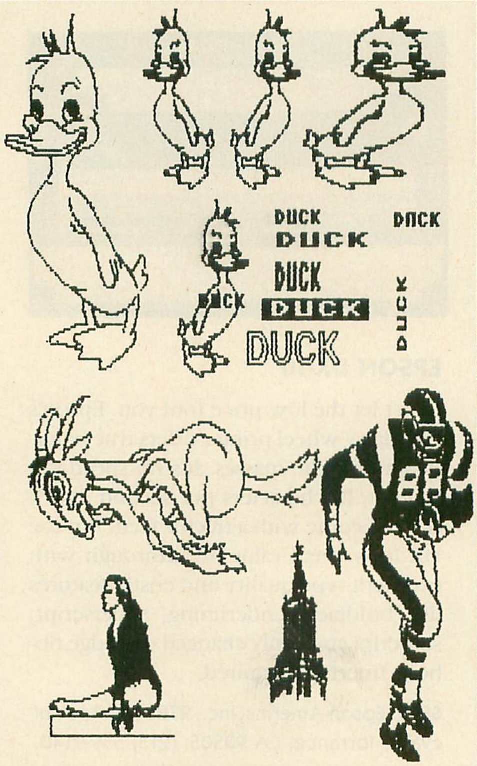
REGULAR SIZE - lets you create your own character set. Script

DOUBLE SIZE - lets you create double size character set.

SHADOW BLOCK CLOSED

ICONS:

PATTERNS:



80 COLUMN DISPLAY WORD PROCESSOR NOW AVAILABLE

MTS Software's WRITE 80, an 80 column display, full-featured word processor is now available. No additional hardware is required. It works with a TV or monitor. Printer codes can now be inserted.

It has features such as block move, overwrite, help screen, justification, automatic centering, etc.

SUPPORT PROGRAM FOR WRITE 80

MTS's PRINT PLUS is an Epson printer utility program for WRITE 80. It lets you design your own character sets for the computer and the printer. Using the character sets you create or some that are provided, you can print out your text from WRITE 80 on the Epson printer.

CARD

CREATE YOUR OWN GREETING CARDS USING ANY COMBINATION OF TEXT, GRAPHICS AND BORDERS ON ALL 4 PAGES. UTILIZES FEATURES SIMILAR TO ARTIST UNLEASHED.

LAYOUT

COMBINE 2,3 OR 4 COLUMNS AND HEADLINES OF UNRESTRICTED TEXT AND GRAPHICS TO CREATE NEWS PAGES, POSTERS, LEAFLETS, ADS. LETTERHEADS. ETC.

NOTE: THIS ENTIRE AD WAS CREATED USING MTS'S LAYOUT PROGRAM.



Coming soon!

DATA DISKS

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BIG PICTURE

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PRINT PLUS.........29.95
*ARTIST UNLEASHED..49.95
*CARD..............39.95
*LAYOUT............39.95

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For direct orders enclose the amount plus $3 for shipping. Specify UPS or first class mail delivery
NY State residents add 8% sales tax

Order Line
716-634-0578

MTS Software
P.O. Box 623
Williamsville, NY 14221

HARDWARE

well be the best deal around for color/ sound video. The big plus here is the sharp color image provided by the 1702's separate chrominance and luminance output, which will also go great with your VCR. Standard video output is also provided.

$225. Commodore Computer, 1200 Wilson Drive, West Chester, PA 19380. (800) 247-9000.



AMDEK 300A

This amber monochrome monitor makes for easy reading, especially when doing a lot of word processing or database entry. We use this here at Antic with an Atari 800 computer and our busiest letter-quality printer. It does the job well.

$199. Amdek, 2201 Lively Boulevard, Elk Grove Village, IL 60007. (312) 364-1180.

NEC 1215

This color monitor offers clear, crisp hues with equally good sound. You can adjust brightness, color, tint, volume and sharpness. At Antic it's a favorite for game-playing. Note: Color monitors cannot support 80-column screens, most desirable for word processing. (Not that it's easy to find an 80-column enhancement for Atari today.)

$399. NEC Home Electronics, 1401 Estes Avenue, Elk Grove Village, IL 60007. (312) 228-5900.

UNIQUE

U.S. DOUBLER

A simple hardware modification for your 1050 disk drive that gives you true double density. Supports the ultra-fast I/O features of SpartaDOS disk operating system.

$69.95 including SpartaDOS. ICD Inc., 1220 Rock Street, Suite 310, Rockford, IL 61101. (815) 229-2999.

OMNIMON

Unravel the secrets of top programmers. This easy hardware modification provides a resident machine language monitor and lets you examine commercial programs in memory while they run.

$69.95. CDY Consulting, 421 Hanbee, Richardson, TX, 75080. (214) 235-2146.

PROBURNER

This professional-quality EPROM burner is a cartridge that plugs right into your Atari and programs chips from its own built-in socket. It can be used to program a wide variety of EPROM and EEPROM types. And it's easier to use than any other burner made for the Atari.

$149, 32K cartridge. Thompson Electronics, 7 Jackes Avenue, Suite 502, Toronto, Ontario M4T 1E3, Canada. (416) 960-1089.

C.E.A. HOME CONTROL

If you want to use your Atari to regulate a home appliance control system, the C.E.A. hardware-software package uses a joystick port interface to start or stop as many as four devices. A heater/ac temperature controller is included, and the BASIC software is reprogrammable.

$89.95, 48K disk. Computer Engineering Applications, P.O. Box 4878, Las Vegas NV 89127.

COMPETITION PRO 5000

Designed to bring an "arcade feel" to the Atari, the Model 5000 joystick features a microswitch assembly for greater accuracy and higher scores. Comes with a five-foot cord and unconditional two-year warranty.

$17.95. Competition Pro, 2609 Greenleaf Avenue, Elk Grove, IL 60007. (312) 228-1810.



COMPUTEREYES

As soon as a review copy of this slow-scan video acquisition system arrived at **Antic**, we set up a video camera and started digitizing pictures of everyone who would sit still long enough. Then we printed out the images with **Print Shop**, tinted, retouched and defaced them with touch tablets, and even sent them out on **CompuServe**. You can also capture images from videotape recorder, video disk or live TV. Includes interface module and software on disk. For $399.95, the package includes a basic black & white video-camera.

$129.95, 48K disk. Digital Vision, Inc., 14 Oak Street, Suite 2, Needham, MA 02192. (617) 444-0940.

S.A.M. (Software Automatic Mouth)

S.A.M. is a voice synthesizer on a disk that sounds just about as good as the much more expensive "black box" voicemakers. S.A.M. is fun, flexible, easy to use and has a good manual. You can add speech to your own BASIC and machine language programs. S.A.M. uses only 9K memory and works with all Atari computers.

$59.95, 16K disk. Tronix, 8295 S. La Cienega Boulevard, Inglewood, CA 90301. (213) 215-0529.

INTERFACES, BUFFERS

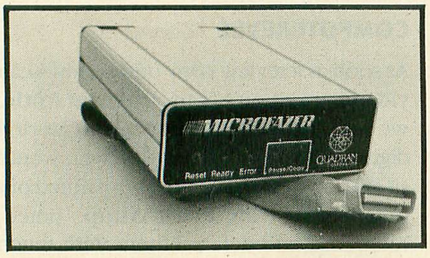
ATARI 850

The Atari 850 Interface Module is a versatile tool that converts data from your computer into formats compatible with the RS-232 serial standard used by most modems, and also for the Centronics parallel standard used by most printers. It's not easy finding an 850 at your local computer

HARDWARE

store. See August, 1985 **Antic** for a list of dealers.

$87-$160, depending on dealer. Atari Corp., 1196 Borregas Avenue, Sunnyvale, CA 94086. (408) 745-2000.



QUADRAM MICROFAZER

Quadram's Microfazer is a printer buffer that eliminates those frustrating pauses as you wait for your 25-page masterpiece to print. The Microfazer comes in different buffer sizes. Three are listed below. When choosing, figure on 2K per printed page.

$179/8K, $299/64K. Quadram Corporation, 4355 International Boulevard, Norcross, GA 30093. (404) 923-6666.

INTERFAST-1

The Interfast-1 is a programmable printer interface with 4K RAM for use as a printer buffer or as storage for custom character sets. A software utilities disk is included to allow for downloading character sets into the Interfast-1 and using those character sets with your word processing program and graphics printer. It provides a Centronics parallel interface. Used as a buffer, it stores about two text pages.

$129.95. Advanced Interface Devices, PO Box 2188, Melbourne, FL 32901. (305) 242-2772.

MODEMS

ATARI 1030

What more can we say about the inexpensive and widely used 300 baud Atari 1030 modem? All you need is 16K and a telephone line—you can telecommunicate without even an interface or a disk drive. However, disk communications software is included, along with a free introductory subscription to CompuServe and Dow Jones Retrieval Service.

$59.95. Add-On Systems, 524 Second Street, San Francisco, CA 94107.

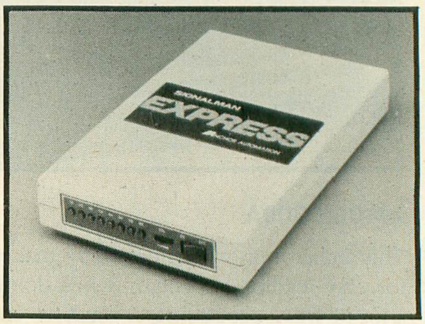
HAYES SMARTMODEM 1200/2400

Hayes is the industry standard. The Smartmodem 1200 ($599) offers solid construction, direct connection, automatically adjusted baud rate, internal speaker, auto-answering and the best documentation around. You can use it with radioteletype, as a data line monitor, as a local network or you can configure internal DIP switches to suit your needs. The 2400 ($899) offers all of these features plus 2400 baud, compatibility with Bell 103, 212A and CCITTB.22 communication standards, auto answer, autodial, non-volatile memory, and is software controlled, so no external switches are needed.

Hayes Microcomputer Products, 5835 Peachtree Corner East, Norcross, GA 30092. (404) 449-8791.

SIGNALMAN EXPRESS

Anchor Automation is replacing the MKXII, with the Express, a competitively priced ($399), 99.9% Hayes compatible with more features for the same price. This direct-connect, multiple-baud modem has



autodial, auto answer, 18 programmable set registers, eight LED lights, eight dip switches, speaker with volume control and a memory chip that stores 10 phone numbers. You'll need an RS-232-to-DB cable (about $22) to connect to the 850 interface. Two year warranty.

$399. Anchor Automation, 6913 Valjean Avenue. Van Nuys, CA 91406. (818) 997-7758.

ONLINE SERVICES

Hourly rates and membership fees for commercial online services are subject to change. Contact individual companies for latest information. You'll need a modem to hook up.

COMPUSERVE

The leading online information service, Compuserve offers stock quotes, news, weather, airline reservations, games, recipes, shopping and special interest groups on dozens of topics—including the ANTIC ONLINE edition and an active SIG*Atari with hundreds of downloadable programs. Evening and weekend rates are $6 per hour for 300 baud and $7.75 for 1200 baud. $40 entry fee. Highly addictive.

500 Arlington Center, Box 20212, Columbus, OH 43220. (800) 848-8199; in Ohio (614) 457-8600.

DELPHI

Delphi offers news, electronic mail, and searchable databases. But it specializes in user-created files, which may be either public or private. Seek expert advice, confer in realtime with other users, and look for SIG*Atari and *ANTIC ONLINE* too.

continued on page 36

THE MOST CHALLENGING GAMES AT THE MOST REASONABLE PRICES

SSI	LIST PRICE	OUR PRICE
Battle for Normandy	$40	$27
Breakthrough/Ardennes	$60	$40
Broadsides	$40	$27
Carrier Force	$60	$40
Colonial Conquest	$40	$27
Combat Leader	$40	$27
Computer Ambush (2nd Ed.)	$60	$40
Computer Baseball	$40	$27
Computer Quarterback	$40	$27
The Cosmic Balance	$40	$27
Cosmic Balance II	$40	$27
Eagles	$40	$27
Field of Fire	$40	$27
50 Mission Crush	$40	$27
Fortress	$35	$23
Galactic Adventures	$60	$40
Gemstone Warrior	$35	$23
Imperium Galactum	$40	$27
Kampfgruppe	$60	$40
Knights of the Desert	$40	$27
Objective Kursk	$40	$27
Operation Market Garden	$50	$33
Phantasie	$40	$27
Questron	$50	$33
Rails West	$40	$27
Reforger 88	$60	$40
Ringside Seat	$40	$27
Six Gun Shootout	$40	$27
Tigers in the Snow	$40	$27
War in Russia	$80	$53

MICROPROSE	LIST PRICE	OUR PRICE
Crusade in Europe	$40	$27
Decision in the Desert	$40	$27
F-15	$35	$24
Hellcat Ace, Spitfire Ace	$30	$20
Kennedy Approach	$35	$24
Mig Alley Ace	$35	$24
Nato Commander	$35	$24
Solo Flight	$35	$24

ELECTRONIC ARTS	LIST PRICE	OUR PRICE
Archon	$24	$16
Archon II: Adept	$35	$23
Cut & Paste	$24	$16
Financial Cookbook	$40	$27
M.U.L.E.	$24	$16
Murder on the Zinderneuf	$24	$16
Music Construction Set	$24	$16
One on One	$35	$23
Realm of Impossibility	$24	$16
Seven Cities of Gold	$35	$23

AVALON HILL	LIST PRICE	OUR PRICE
Clear for Action	$30	$20
Combat Chess	$25	$17
Gulf Strike	$30	$20
Jupiter Mission 1999	$50	$33
Legionnaire	$30	$20
Maxwell Manor	$25	$17
Panzer Jadg	$30	$20
Quest of the Space Beagle	$35	$23
T.A.C.	$40	$27
Telengard	$28	$19

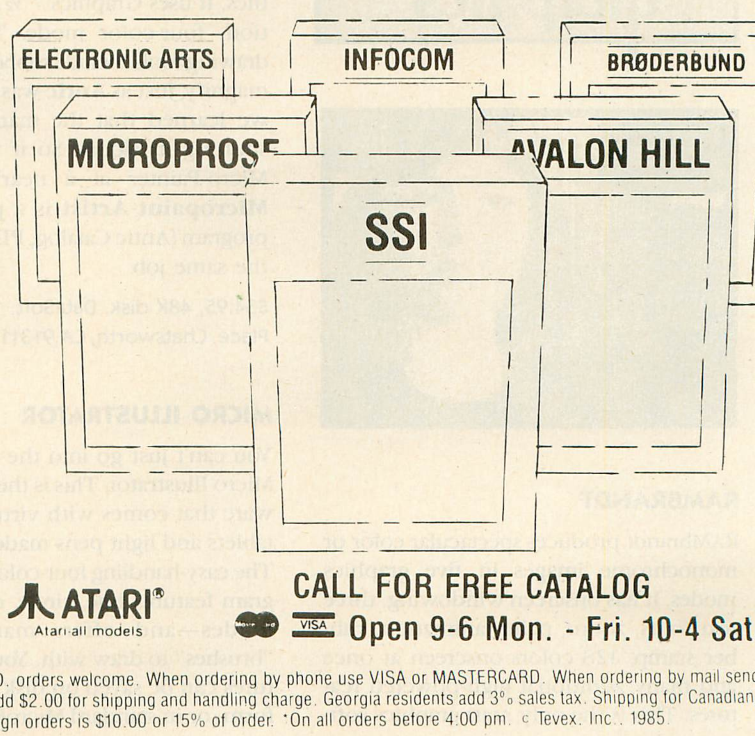
INFOCOM	LIST PRICE	OUR PRICE
Cutthroats	$35	$24
Deadline	$45	$30
Enchanter	$35	$24
Hitchhikers Guide/Galaxy	$35	$24
Infidel	$40	$27
Planetfall	$35	$24
Seastalker	$35	$24
Sorcerer	$40	$27
Starcross	$45	$30
Suspect	$40	$27
Suspended	$45	$30
Wishbringer	$35	$24
Witness	$35	$24
Zork I	$35	$24
Zork II, III	$40	$27
Four-in-one-Sampler	$ 8	$ 6
Invisiclues	$ 8	$ 6

ETC.	LIST PRICE	OUR PRICE
Chickamauga	$35	$25
Flight Simulator II	$50	$36
Micro League Baseball	$40	$27
Mindwheel	$40	$27
Napoleon at Waterloo	$35	$25
Operation Whirlwind	$40	$21
Rome & the Barbarians	$35	$25
Ultima III	$60	$40
Universe	$98.50	$70

Blank Disks—Bonus Disks SSDD $12/box of 11

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ONLINE SERVICES

Lifetime registration is regularly $49.95, which includes two free evening hours. Evening and weekend rate is $6 an hour for 300 or 1200 baud.

3 Blackstone Street, Cambridge, MA 02139. (800) 544-4005; in MA (617) 491-3393.

THE SOURCE

Now this strong general-information online network also offers speedy 2400 baud premium service. Membership fee of $49.95 includes unlimited free time to learn the system in an online tutorial. Latest pricing is by the minute. Evening and weekend rates per minute are: 14 cents for 300 baud, 18 cents for 1200 baud and 20 cents for 2400 baud.

1616 Anderson Road, McLean, VA 22102. (703) 734-7500.

GAMES COMPUTERS PLAY

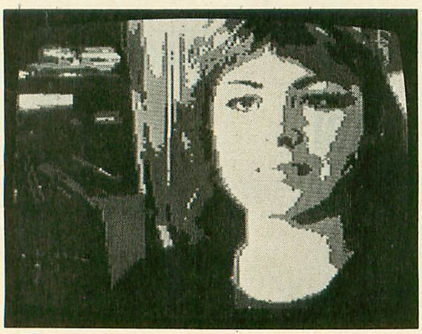
Enter gameworld . . . log on and suddenly you're in a wonderland of bold, state-of-the-art online color graphics. Your Atari's playmate is a powerful 300 megabyte minicomputer that offers spectacular interactive games, real-time conferencing, electronic mail and public domain downloads. Requires 48K disk drive, 1200 baud modem recommended. Evening and weekend rate is $6 an hour.

112 East Market Street, York, PA 17401. (717) 848-2660.

SOFTWARE

The software in this section runs on all 8-bit Atari computers, unless a required minimum memory size is specified in the entry. Software for the new 16-bit ST models is described in this issue's ST Section.

GRAPHICS



RAMBRANDT

RAMbrandt produces spectacular color or monochrome images in five graphics modes. It has onscreen windowing, three text fonts, zoom, paint, animation, rubber stamp, 128 colors onscreen at once and many additional high-powered features. This is the only Atari graphics software you can buy that is compatible with the inexpensive Okimate 10 color printer.

$19.95, 48K disk. Antic Catalog, AP157.

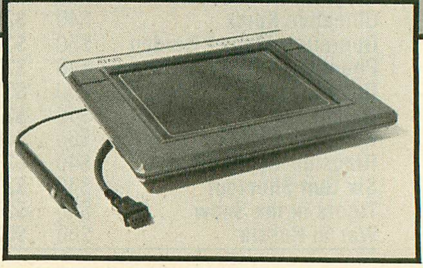
MICRO-PAINTER

Micro-Painter is the original and best-known joystick drawing program for Atari, and it set a standard format for graphics files. It uses Graphics 7 ½, a high resolution, four-color mode. The program's drawing tools include rubber band, fill and magnify. Just as **Antic** was going to press, we learned that the manufacturer was shutting its doors. So if you can't find Micro-Painter at a nearby store, **PD Micropaint Artist** is a public domain program (Antic Catalog, PD053) that does the same job.

$34.95, 48K disk. DataSoft, 19808 Nordhoff Place, Chatsworth, CA 91311. (213) 701-5161.

MICRO ILLUSTRATOR

You can't just go into the store and buy Micro Illustrator. This is the graphics software that comes with virtually all touch tablets and light pens made for the Atari. The easy-handling four-color drawing program features line, circle, mirror and fill modes—and offers many styles of "brushes" to draw with. Your finished pictures can be saved on disk in compacted form, or in standard MicroPainter format.



ATARI TOUCH TABLET

The stylus has a built-in button controller and won't get lost because it's attached by cable to a sturdy tablet. This is the easiest tool for creating fine Atari graphics. But it can be tough to find. Runs powerful, easy-to-use Micro Illustrator software (under AtariArtist brandname) in a handy cartridge.

$59.95, 32K cartridge. Atari Corp., 1196 Borregas Avenue, Sunnyvale, CA 94086. (408) 745-2000.

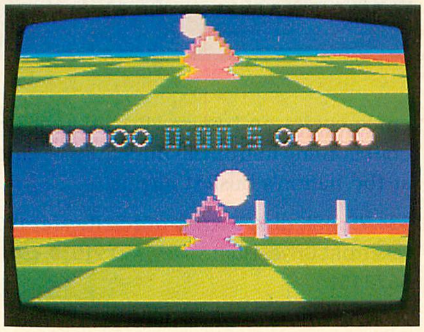
KOALAPAD, KOALA LIGHT PEN

The KoalaPad's Atari version may be hard to find in stores this Christmas. But the manufacturer has assured us that the popular graphics tablet is still being manufactured and supported for the Atari. Available at the same price is the Koala Light Pen, which also uses Micro Illustrator on disk. Call Koala's toll-free number for your nearest dealer.

$99.95 each, 48K disk. Koala Technologies, 2065 Junction Avenue, San Jose, CA 95131. (800) KOA-BEAR.

software

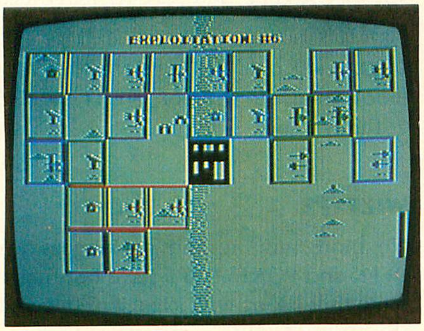
GAMES



BALLBLAZER, RESCUE ON FRACTALUS

The long-awaited Lucasfilm arcade games are everything you would expect in the "Star Wars" tradition. Ballblazer puts you at the controls of a hovercraft-like Rotofoil in the year 3097 as you participate in a futuristic soccer bout. Rescue on Fractalus puts you in the cockpit of a Valkyrie Fighter cruising at mach 7.2. This space-age flight simulator takes you over detailed fractal landscapes and offers 16 levels of play. From the exquisite animation while the games are loading, to the music and the challenging action—these games define state-of-the-art.

$40 each, 48K disk. Epyx, Inc., 1043 Kiel Court, Sunnyvale, CA 94089. (408) 745-0700.



M.U.L.E.

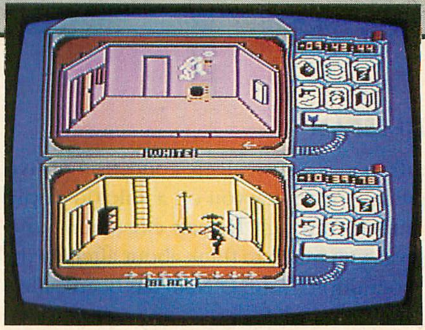
Colonize a planet with the "aid" of the balky Multiple Use Labor Element robots. Food and minerals are quite limited. So, do you cooperate with the other players (up to four) or do you double-cross them?

$22.95, 48K disk. Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403. (415) 571-7171.

ODESTA CHESS

The better microcomputer chess programs, like this one, are currently competitive with even some mainframe programs—and certainly play chess well beyond the skill of most non-pro humans. Larry Atkin, who programmed Odesta Chess, also helped write the groundbreaking CHESS program at Northwestern University.

$69.95, 48K disk. Odesta Corp., 4084 Commercial Avenue, Northbrook, IL 60062. (312) 498-5615.



SPY VS. SPY

Cartoonist Antonio Prohias' black and white peak-capped secret agents have been double-crossing each other in Mad Magazine since 1960. You and your opponent leave traps for each other—bombs, electrified water, guns with strings attached to the trigger—and rely on an arsenal of remedies. Brings out the sadist in you!

$29.95, 48K disk. First Star Software, 18 E. 41 Street, New York, NY, 10017. (212) 532-4666.

GAME SOFTWARE YOU CAN TRUST

You could walk into a store blindfolded and buy almost any Atari title from these publishers with the confidence that you now own a highly enjoyable game or application. Most of these products require 48K memory and a disk drive. Prices range from $19 to $60.

Text Adventures: INFOCOM

Infocom is almost synonymous with critically acclaimed, slickly packaged interactive text adventure games. Like paperback novels, they come in genres such as science fiction, fantasy, detective mysteries and Indiana Jones-ish thrillers. Unlike paperback novels, the lead character is *you*.

Many Infocom games are packaged with goodies like maps, lab reports, journals, hieroglyphic stone rubbings and truly hilarious manuals. Our favorites are the pure fantasy worlds (**Zork, Enchanter, Sorcerer**) and anything written by Steven Zeretsky (**Planetfall**). This year's biggest hit was **Hitchiker's Guide to the Galaxy**, based on the eccentric Douglas Adams novel.

Infocom, Inc. 55 Wheeler Street, Cambridge, MA 02138. (617) 492-1031.

Strategy War Games: STRATEGIC SIMULATIONS INC.

In these historically accurate, complex military simulations, you can wear the shoes of Napoleon, Eisenhower and other fabled commanders as you lead your nation to battle.

Some of the SSI titles we reviewed enthusiastically this year are **Computer Ambush, Reforger '88, Kampfgruppe** and **Broadsides**. Classic introductions to the genre include **Field of Fire** and **Eagles**.

Strategic Simulations, Inc., 883 Stierlin Road, Bldg. A-200, Mountain View, CA 94043. (415) 946-1200.

BRODERBUND/SYNAPSE

In 1985, one of the most successful publishers of game and applications software joined forces with another outstanding publisher that specialized in Atari software. Now, you can't miss with almost *any* Atari title from Broderbund or Synapse.

For proof, try the addictive ladder action of **Loderunner** or **Pharaoh's Curse**, the high-flying excitement of **Choplifter** or **Blue Max 2001**.

Broderbund/Synapse. 17 Paul Drive, San Rafael, CA 94903. (415) 479-1170.

SOFTWARE

LIFESPAN

Lifespan is a surrealistic collection of five games that takes you on a kaleidoscopic journey through human existence—and gives you much to think about afterwards. Programmer John O'Neill has been called "the Salvador Dali of computer games."

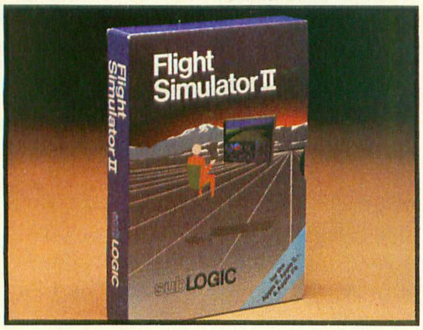
$17.95, 48K disk. Antic Catalog, LS100.



GREAT CROSS COUNTRY ROAD RACE

This is the Ferrari Dino of race games. It's got variety, clever illusions, great sounds and scenery. None of that crash-and-burn mentality here. In this game, your opponent is time—and you'll spend lots of it losing yourself in one of the best releases of the year.

$24.95, 48K disk. Activision, 2350 Bayshore Frontage Road, Mountain View, CA 94043. (415) 960-0410.



FLIGHT SIMULATOR II

The most advanced flight simulation program available for the Atari puts you in the pilot's seat of a Piper Cherokee Archer. Features color scenery of Chicago, New York, Seattle and Los Angeles, and 80 usable airports. Remember, this is a sophisticated training program that requires learning very precise and detailed operating instructions.

$49.95, 48K disk. Sublogic Corporation, 713 Edgebrook Drive, Champaign, IL 61820. (217) 359-8482.

TRIVIA QUEST

The big difference between this game and others of the genre is that it incorporates trivia questions into a race around a game board (a la Trivial Pursuit.) It's also the first trivia game to utilize the graphic and scrolling capabilities of the Atari with first-rate graphics and animation.

$39.95, 48K disk. Royal Software, 2160 W. 11th Avenue, Eugene, OR 97402. (503) 683-5361.



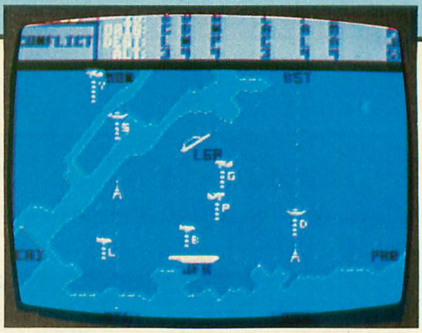
F-15 STRIKE EAGLE

Your first mission sends you to Libya to bomb military airfields. Launch into aerial combat with this almost too realistic joystick-controlled computerization of seven sky battlezones over the Mid-East and Viet Nam. You get state-of-the-art weapons systems, computerized radar, eight supersonic guided missiles, 18 bombs and a 20 mm cannon with 1,000 rounds of ammunition.

$34.95, 48K disk. MicroProse Software, 120 Lakefront Drive, Hunt Valley, MD 21030. (301) 667-1151.

KENNEDY APPROACH

Strap on your headset and pop a few No-Doz tablets—you'll be glad when this shift is over. This exciting air traffic controller simulation even includes computer-generated speech. Rescue passengers from



emergencies, and control 20 different aircraft coming in from all directions to land at the nation's busiest airports.

$34.95, 48K disk. Microprose Software, 120 Lakefront Drive, Hunt Valley, MD 21030. (301) 667-1151.

EDUCATION

SAT PREP

Your college-bound offspring might groan when they unwrap S.A.T. preparation software instead of a tape deck that costs just as much, but they'll thank you for it later. **Computer Preparation for the SAT** by Harcourt, Brace, Jovanovich includes 3 disks and a 50-page manual. They offer a fine 469-page book **How to Prepare for the SAT** (sold separately for $7.95). **Krell's College Board SAT Exam Preparation Series** includes a 47-page booklet and an intimidating set of eight double-sided disks.

$79.95, 48K disk. Harcourt Brace Jovanovich, 757 Third Avenue, New York, NY 10017. (800) 543-1918.

$229.95, 48K disk. Krell Software, 1320 Stony Brook Road, Stony Brook, NY 11790. (516) 751-5139.

WIZTYPE

No more hunting and pecking as you PEEK and POKE. You'll have fast fingers in no time, along with a laugh or two with the "Wizard of Id" comic-strip characters as your guide. WizType is more than a typing tutor—it teaches proper finger positioning, lets you create your own typing lessons, and includes an amusing game.

$34.95, 48K disk. Sierra Online, P.O. Box 485, Coarsegold, CA 93614. (209) 683-6858.

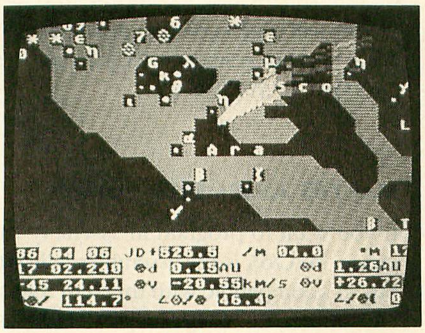


DUCKS AHOY, SEAHORSE HIDE N' SEEK

You're in Venice in a gondola and have to pick up ducks who want to go to Lido Beach. But watch out for the hippo who upsets boats. Ducks Ahoy!, developed by Joyce Hakansson Associates, helps young children with their fine motor coordination and counting skills. The crisp graphics, adorable ducks and equally cute sound effects make Ducks Ahoy! one of the years' best.

Sea Horse Hide 'n' Seek is another Joyce Hakansson winner. By manuvering a seahorse through a coral reef and away from old wrecks and lagoon fish, this adventure program teaches kids about underwater life.

$12.95 each, 16K cartridge. Ages 3-6. CBS Software, One Fawcett Place, Greenwich, CT 06836. (203) 622-2614.



HALLEY PATROL

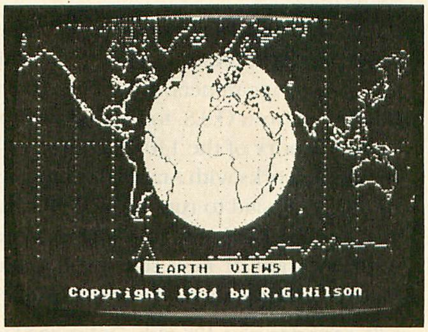
We can't imagine a more timely gift for the astronomy buff than Halley Patrol. With this joystick-driven, astronomically accurate program, you can watch the comet fly through space against a high-resolution scrolling map. Celestial coordinates indicate the best time and location to view the comet. Flip the disk for an educational graphic presentation on the history of Halley.

$17.95, 48K disk. Ages 12 to adult. Antic Catalog, AP159.

SPACE BASE

A must if you own a telescope. This graphically stunning scrolling map and space atlas offers detailed scientific data for hundreds of the brightest stars. With its extensive documentation, the program is equivalent to a college-level introductory astronomy class.

$19.95, 48K disk. Ages 12 to adult. Antic Catalog, AP142.



EARTH VIEWS

It's rare when educational software programs are more than just computerized textbooks. Earthviews is a computerized atlas and adventure/trivia game that features detailed high resolution maps and a 3-D view of earth rotating on any axis.

$19.95, 48K disk. Ages 12 to adult. Antic Catalog, AP141.



STICKYBEAR NUMBERS

Children's book illustrator Richard Hefter's Stickybear series is lauded by educators as an educational software classic. Stickybear shows flapping geese, waddling penguins and chugging trains in groups of one through nine, depending upon the number key that the child presses. Children learn how to count, add and subtract, and get a Stickybear counting book, poster and stickers too.

$29.95, 48K disk. Ages 3-6. Xerox/Weekly Reader, 245 Long Hill Road, Middletown, CT 06457. (203) 347-7251.

TINK'S ADVENTURE, TUK GOES TO TOWN, TONK IN THE LAND OF BUDDY-BOTS, TINK'S SUBTRACTION FAIR

For years, writer Mercer Mayer has been delighting children (and the **Antic** staff) with his funny little mechanical monsters. In Tink's Adventure, children get a chance to learn the alphabet and the computer keyboard. When Tuk Goes To Town, there are adventures leading to spelling and vocabulary practice, memory building and hours of fun. Tonk in the Land of the Buddy-Bots has six games, each with four levels of play, ensuring a fairly long game time. Tonk's Subtraction Fair strengthens math skills as Tonk goes to a carnival and plays five different games. The animated robots and music will draw the whole family to the computer screen.

$34.95 each, 48K disk. Ages 4-8. Mindscape, Inc., 3444 Dundee Road, Northbrook, IL 60062. (312) 480-7667.

SPEEDREAD

Look out Evelyn Woods! This excellent, well-documented program increases your reading speed, improves eye movement, character and word recognition, and peripheral vision. Reading Compuserve at 1200 baud will be a piece of cake.

$64.95, 16K disk. Inet Corp., 536 Weddell Drive, Sunnyvale, CA 94086. (415) 797-9600.

COMMUNICATIONS

HOMEPAK

This package integrates word processing, a filing manager and telecommunications—ideal for serious telecommunications users. Written by Russ Wetmore and used by all his fellow CompuServe SIG*Atari sysops. It's worth buying just

SOFTWARE

for HomeTerm, a telecommunications program that will work with just about any 300 or 1200 baud modem.

$49.95, 48K disk. Batteries Included, 30 Mural Street, Richmond Hill, Ontario, L4B 1B5, Canada. (416) 881-9941.

SMART 1030

For less than one tenth of the price of a Hayes Smartmodem, you can use Smart 1030 software to upgrade your 1030 modem for compatibility with the Hayes standard command set, plus additional features like autodial, onscreen help commands and a BBS database. It also allows you to use other popular modem programs without the hard-to-find Atari 850 Interface Module.

$19.95, 16K disk. E&B Computer Services, P.O. Box 292506, Columbus, OH, 43229.

BBS CONSTRUCTION SET

Now you can personalize your bulletin board without needing to write programs. Create online surveys, 65,792 security levels, private email and more. Supports 300, 1200 and 2400 baud modems.

$24.95, 48K disk. Antic Catalog, AP146.

CHAMELEON

If you want to log on to a mainframe from home, (or Kermit between an XL and an ST) you need the Chameleon CRT Terminal Emulator. This invaluable program lets your Atari act like a variety of computer terminals such as a DEC VT-52 or IBM 3031. Wide-screen 80-column emulation, UNIX-compatible, autodial. Supports Hayes-compatible and Atari 835/1030 modems.

$19.95, 48K disk. Antic Catalog, AP113.

BACKTALK

State-of-the-art telecommunications software for 300, 1200 and 2400 baud. With Backtalk your Atari can autodial other BBS's in the middle of the night and upload or download files in any of three protocols. Extra-large buffer supports 130XE RAMdisk. You can create unlimited macro libraries. Written in compiled ACTION! by the programmers of Paper Clip and Synfile+.

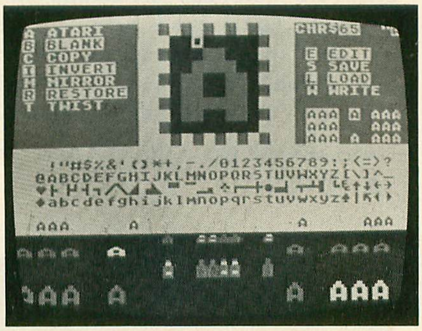
$19.95, 48K disk. Antic Catalog, AP154.

LANGUAGES & TOOLS

BASIC XE

BASIC XL had long been the classiest, most powerful BASIC language available for Atari programmers. Now new BASIC XE is here from O.S.S. to harness the full 128K memory of the 130XE computer—yet it also works with Atari XL computers. BASIC XE is said to run Atari BASIC programs at least twice as fast, and it comes with an array of new statements, automated editing features and extra utilities.

$79, cartridge plus 48K disk. Optimized Systems Software, 1221B Kentwood Avenue, San Jose, CA, 95129. (408) 446-3099.



INSTEDIT

Create custom character sets with your joystick. Build arcade-style, high resolution game routines. Instedit has been used by more professional Atari programmers than any other character editor. Requires Atari BASIC.

$15.95, 48K disk. Antic Catalog, AP117.

ACTION!

This amazingly fast and powerful language blends elements of Pascal and C—but is much easier to program on the Atari. ACTION! contains a superior screen editor that makes programming a joy and was the basis of the outstanding Paper Clip word processor.

$99, 16K cartridge. Optimized Systems Software, 1221B Kentwood Avenue, San Jose, CA 95129. (408) 446-3099.

DEEP BLUE C

C is the most widely accepted programming language for the new generation of big-memory personal computers like the ST. The Deep Blue C Compiler is a proper subset of C, so programs written for it will run almost without change on computers supporting the full language. Requires 48K, and a text editor such as Word Magic.

$19.95. Antic Catalog, AP114.

KYAN PASCAL

Finally, a Pascal for the Atari that doesn't require two disk drives and a computer science degree to use. This is a fast version with all of the features of Standard Pascal, the teaching and programming language widely used in colleges. Comes with a built-in editor, search and replace, and a library of graphics routines. Compiles files directly into assembly language.

$69.95, 64K double density disk. Kyan Software, 1850 Union Street, #183, San Francisco, CA 94123. (415) 775-2923.

MAC/65 ASSEMBLER EDITOR

If you want to program in assembly language, MAC/65 is the assembler editor to buy. It's compatible with the Atari Assembler Editor, as long as you don't use MAC/65's powerful extra commands. MAC/65 contains a speedy compiler and a truly excellent debugger.

$80, 16K disk; $99, 16K cartridge. Optimized Systems Software, 1221B Kentwood Avenue, San Jose, CA, 95129. (408) 446-3099.

MMG BASIC COMPILER

Convert your BASIC programs into binary machine language files that will run up to 15 times faster than the original. Unlike other compilers, MMG will also produce

assembly source code which you can analyze and alter. Choose between integer and floating point arithmetic and put your data statements anywhere. Available in both double and single density, requires BASIC.

$99.95, 48K disk. MMG Micro Software, P.O. Box 131, Marlboro, NJ 07746. (201) 431-3472.

SHERLOCK 1050

With this disk sector editor you can customize any program in your library on the Atari 1050 (or 810) disk drive. You don't need to be an assembly language programmer to modify commercial software, alter programs to easily access RAMdisks, change title screens, customize menus, even disassemble from the disk itself. Any machine language file will reveal its secrets to Sherlock.

$19.95, 48K disk. Antic Catalog, AP155.

printing

PRINT WIZ

This powerful printer dump mixes text and graphics for hardcopies from most of the popular printers. Can print sideways on the page. Includes special handlers for popular graphics programs. Changes type size directly from your keyboard. By the author of Kwik Dump (**Antic**, March 1985).

$29.95, 16K disk. Allen Macroware, P.O. Box 2205, Redondo Beach, CA 90278. (213) 376-4105.

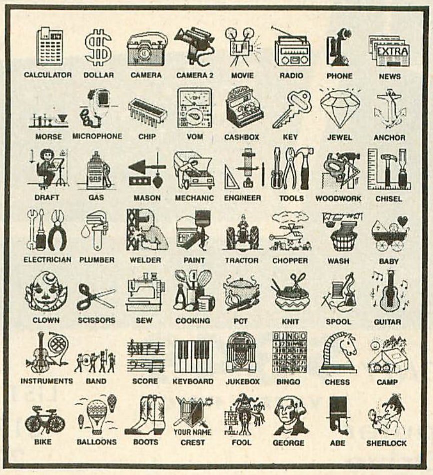
LISTER PLUS, PICTURE PLUS

These two utilities (sold separately) can stretch your dot-matrix printer to its limits. Lister Plus ($19.95) among many other things, dumps any listed file (including programs) to the printer using any custom character set you choose. Picture Plus ($29.95) manipulates most types of picture files, so you can save them in standard files that can be used with a BASIC program, or dump them to the printer in any of four sizes. Requires BASIC and 48K disk.

Non-Standard Magic, P.O. Box 45, Girard, OH 44420. (216) 539-6033.

PRINTSHOP (& LIBRARIES)

Just open any Atari users group newsletter to see samples of how popular this graphics printing program is. Virtually foolproof to operate, no wonder Print Shop is Broderbund's best seller. Unwrap this one before Christmas. In minutes, you'll be cranking out nifty Christmas cards, wrapping paper and signs.

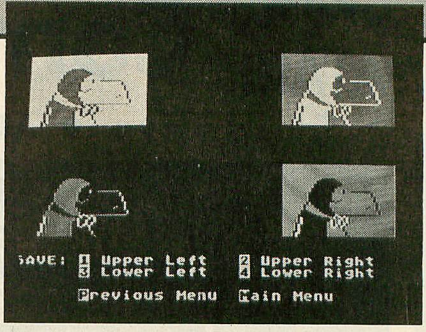


Volumes I & II of the **Print Shop Library** ($24.95 each) are collections of icons, doodles and dingbats ranging from bowling pins to safety pins. These popular illustrations feed right into your Print Shop and pop up everywhere in newsletters, school reports, and brochures.

$49.95, 48K disk. Broderbund Software, 17 Paul Drive, San Rafael, CA 94903. (415) 479-1170.

GRAPHIC SHOP

Now you can use your graphics editing tools such as Micro-Painter, KoalaPad or Atari Touch Tablet to create decorative icons and graphics files for Broderbund's Print Shop graphics printing program.. We've been using Graphics Shop at **Antic** to convert digitized photos taken with Computereyes into portraits of the staff. Then we print them out with Print Shop and place our faces on greeting cards, let-



terheads and other goodies to send home to Mom.

$19.95, 48K disk. Antic Catalog, AP156.

word processing

PAPER CLIP

When we use a product day after day to produce this magazine, you know it has the **Antic** Seal of Approval. We write and edit every word with Paper Clip before transmitting the copy to our typesetter via modem. PC lives up to the manufacturer's claim that it's a professional word processor suitable for people who do heavy writing. Paper Clip is easy to learn, offers a split screen with cut-and-paste between both windows, one-key macros, readable characters with true descenders, double-column printing, and virtually every editing feature you'd find in word processing software at ten times the price.

$59.95, 16K disk. Batteries Included, 30 Mural Street, Richmond Hill, Ontario, L4B 1B5 Canada. (416) 881-9941.

LETTER PERFECT

Switching between modes (i.e. edit to print) as well as zipping throughout your document is a breeze with Letter Perfect. You can move from word to word, beginning to end of text easily. Letter Perfect lets you chain files (but not move text from one file to another) and runs easily with a variety of printers. It includes a spelling checker of approximately 30,000 words. If you want a larger dictionary to which you can add words, you can add LJK's **Spell Perfect** ($79.95).

$99.95, 32K disk. LJK Enterprises, 7852 Big Bend Boulevard, St. Louis, MO 63119. (314) 962-1855.

continued on page 44

GIANT PRINTER SALE!!

List $399.00 **10" Printer**

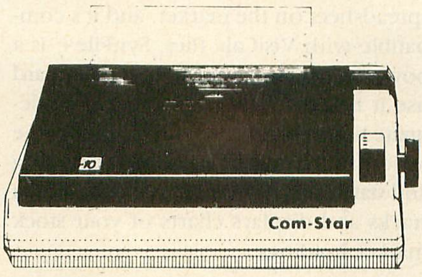
SALE **$179.00** SALE

10" Comstar 10X — This Bi-directional Tractor/Friction Printer prints standard sheet 8½"x11" paper and continuous forms or labels. High resolution bit image graphics, underlining, horizontal tab setting, true lower descenders, with super scripts and subscripts, prints standard pica, compressed, expanded, block graphics, etc. Fantastic value. (Centronics parallel interface.)
List $399.00. **Sale $179.00.**

1 Year Warranty

120-140 CPS

Premium Quality



List $599.00 **15½" Printer**

SALE **$249.00** SALE

15½" Comstar 15X — Has all the features of the 10" Comstar 10X plus a wider 15½" carriage and more powerful electronics to handle large ledger business forms! (Better than FX-100). The 15½" Comstar 15X also prints on standard size paper and continuous forms and labels. Fantastic value. (Centronics parallel interface.)
List $599.00. **Sale $249.00.**

List $499.00 **10" Printer**

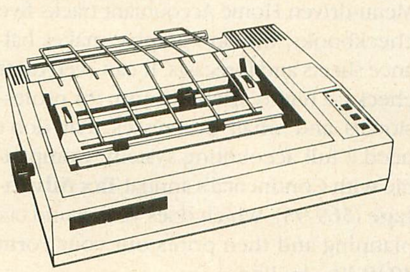
SALE **$229.00** SALE

10" Comstar 160+ High Speed — This Bi-directional Tractor/Friction Printer combines the above features of the 10" Comstar 10X with speed (150-170 cps) and durability. Plus you get a 2K buffer, 96 user definable characters, super density bit image graphics, and square print pins for clearer, more legible print (near letter quality). This is the best value for a rugged dependable printer. (Centronics parallel interface.)
List $499.00. **Sale $229.00.**

1 Year Warranty

150-170 CPS

High Speed



List $699.00 **15½" Printer**

SALE **$299.00** SALE

15½" Comstar 160+ High Speed — This Bi-directional Tractor/Friction Printer has all the features of the 10" Comstar 160+ High Speed plus a wider 15½" carriage and the heavy duty electronics required for today's business loads. You can use large ledger business forms as well as standard sheets and continuous forms and labels. This is the best wide carriage printer in the U.S.A. (Centronics parallel interface.)
List $699.00. **Sale $299.00.**

List $599.00 **10" Printer**

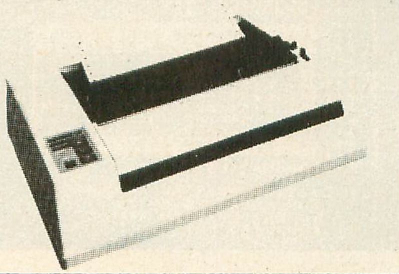
SALE **$259.00** SALE

10" Comstar 2000 — The ultimate printer has arrived! This Bi-directional Tractor/Friction Printer gives you all the features of the Comstar 160 plus higher speed (165-185 cps), 256 downloadable characters, proportional setting, external dark printing mode and a *lifetime printhead warranty. **PLUS ...**

*Lifetime warranty**

165-185 CPS

High Speed & Letter Quality



List $599.00 **10" Printer**

SALE **$259.00** SALE

With the flip of a switch you can go into the letter quality mode which makes all your printing look like it came off a typewriter. Turn in term papers, do articles or just print programs. Have the best of letter quality and speed in one package. Fantastic printer (Centronics parallel interface.)
List $599.00. **Sale $259.00.**

• 15 Day Free Trial — 1 Year Immediate Replacement Warranty

Parallel Interfaces

Commodore-64, VIC 20 — $39.00 Atari — $59.00 Apple II, II+, IIe — $59.00

Add $10.00 ($14.50 for 15½" Printers) for shipping, handling and insurance. Illinois residents please add 6% tax. Add $20.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES, EXCEPT CANADA.

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail!

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312/382-5050 to order

software



ATARIWRITER+

As **Antic** goes to press, we've only seen an early beta test copy of AtariWriter+. But if it gets to the stores in time for the holidays you should check it out—especially if you're a fan of Atari's original word processing software. Atariwriter+ promises a built-in mail merge and spelling checker, plus full use of the 130XE's extra memory for file space.

$49.95 approximately. Atari Corp., 1196 Borregas Avenue, Sunnyvale, CA 94086. (408) 745-2000.

WORD MAGIC

This new, enhanced version of the Word Magic word processor has pop-up menus, online help files, cut and paste features, and a variety of type fonts—all for under $20. Use a joystick or trakball to move the cursor and scan files rapidly. Comes with **Graphic Magic** bonus program that mixes your own graphics with text for printing on an Epson or Gemini. Now uses extra memory in 130XE computer.

$19.95, 48K disk. Antic Catalog, AP130.

SPELL MAGIC

Daniel Webster would roll over in his grave if he could see this 34,000-word integrated computerized dictionary. Run your **Word Magic** (or other AtariWriter-compatible) documents through this spelling checker and watch mistakes disappear. Spell Magic has online help, online menus, and lets you add your own dictionaries of up to 10,000 words each.

$19.95, 48K disk. Antic Catalog, AP144.
$24.95 for all three—Spell Magic, Word Magic and Graphic Magic.

productivity

SYNCALC, SYNFILE+

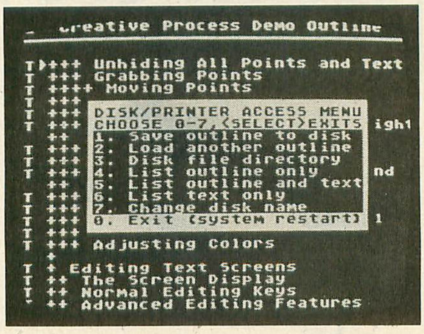
This spreadsheet and database are the keystones of the best integrated (file-compatible) productivity applications series for the Atari currently available. Each program in the series is powerful, yet easy to operate with pop-up menus and simple commands. SynCalc is the best Atari spreadsheet on the market, and it's compatible with VisiCalc files. SynFile+ is a powerful database system, but under hard use it reveals some bugs and has inadequate report writing capacity. Also in the series: **Syntrend**, a combined graphing and statistical program; **SynStock**, which tracks and displays charts of your stock market holdings.

$49.95 each, 48K disk. Synapse (Broderbund) Software, 17 Paul Drive, San Rafael, CA 94903. (415) 479-1170.

HOME ACCOUNTANT

This popular package has been around a while on many different computers. Menu-driven Home Accountant tracks five checkbooks, displays graphs, makes balance sheets and forecasts. It can even print checks, a highly useful feature for professionals and small businesses that don't need a full accounting system. Compatible with Continental's annual **Tax Advantage** ($69.95), which does year-round tax planning and then prints out your Form 1040 line-by-line.

$74.95, 48K disk. Continental Software, 671 Valjean Avenue, Van Nuys, CA 90045. (800) 421-3930.



CREATIVE PROCESS

Creative Process is the Atari's first outline processor like "Think Tank." It's a conceptual organizing tool for making sense out of your busy agenda. This calendar, project manager, and time manager will make it easier for you to be more productive and creative.

$19.95, 48K disk. APX AP151.

HOMECARD

HomeCard moves you closer to a paperless desk. This computerized rolodex file brings your Christmas list, mailing list, personnel files and little black book into the electronic age. Create and print custom labels, even autodial phone numbers with an Atari 1030 or Hayes-compatible modem. From Sparky Starks and Russ Wetmore, who programmed HomePak.

$24.95, 48K disk. Antic Catalog, RW100.

PEACHTREE ACCOUNTING

Finally, there is a genuine business accounting package for the Atari that handles most needs of a professional office, retailer, or other small company. Peachtree's Back To Basics accounting system was successful on the IBM and Macintosh before the Atari version came out. Includes Accounts Payable, Accounts Receivable and General Ledger modules. Prints attractive reports, address labels, even computer-issued checks. Computes finance charges, produces customer master lists and sales journals.

$195, 48K, two disk drives required. Peachtree Software, 3445 Peachtree Road N.E., Atlanta, GA 30326. (404) 239-3165.

DATA PERFECT

This powerful database comes from the same company that makes the Letter Perfect word processor—so it's no surprise that the two programs are compatible. While not as easy to learn as Synfile+, Data Perfect has better report writing and global change capability. Works best with two disk drives.

$99.95, 32K disk. LJK Enterprises, 7852 Big Bend Boulevard, St. Louis, MO 63119. (314) 962-1855.

ST

FIRST ANNUAL ANTIC

ST SHOPPERS guide

ST SHOPPERS GUIDE

ATARI PERIPHERALS



CD ROM

Atari is racing to have its CD ROM unit available shortly after the first of the year. As covered in our October 1985 issue, an entire encyclopedia takes up only one-fifth of one compact digital laser disk, and any entry may be accessed in less than four seconds. The first software available will be the Grolier Encyclopedia. By itself, CD ROM technology is enough of a reason to buy the ST.

$599 (tentatively)

DISK DRIVES

Double your ST data storage with a second 3 ½-inch disk drive. The Atari ST354 single-sided, double-density drive holds 349K after formatting. And if that's not enough, go for the ST314 double-sided drive with 714K.

$199.95—SF354 Single-sided

$299.95—SF314 Double-sided

VIDEO MONITORS

You have a choice of monitors with your ST. The SM124 monochrome monitor offers the highest resolution of 640 X 400 pixels. Or you can choose the SC1224 RGB Color monitor, which draws from a palette of 512 colors.

$199.95—SM124 Monochrome

$399.95—SC1224 RGB Color

PRINTERS

As **Antic** went to press, Atari told us that two new printers for the ST would be coming in October. The letter-quality SDM124 is a daisy wheel printer. The SMM804 dot-matrix model supports graphics and prints 80 characters per second. Either model connects to the ST's Centronics parallel port.

$269.95—SDM124 Letter Quality

$229.95—SMM804 Dot Matrix

Atari Corporation, 1196 Borregas Avenue, Sunnyvale, CA 94086. (408) 745-2000. (Model numbers and prices of Atari Corporation products are subject to change.)

LANGUAGES

4xFORTH

Not counting the Logo that shipped with the ST, 4xForth was the first software for the machine—and the first alternate language. Designed primarily for developers, this 83 Standard Forth includes such sophisticated features as multi-tasking and multi-user capabilities. This version accesses the ST graphics through primitive, lower-level "line A" calls. Later packages will include complete GEM access. See our review in this issue.

$99.95. Dragon Group, 148 Poca Fork Road, Elkview, WV, 25071. (304) 965-5517.

HIPPO-C, HABA SOLUTIONS: BUSINESS LETTERS, WILLS

Hippo-C ($74.95) was eagerly awaited by the first wave of ST buyers who did not know Forth and wanted something more powerful than LOGO. The Haba implementation comes complete with an editor, standard C library and GEM linking and binding files. Look for a review on this product in the **Antic** ST Section soon.

Haba Solutions: Business Letters ($49.95) is a text editor plus a collection of standard letter formats frequently used in business. Choose your letter needs then plug in your own information. Since letters may be created from scratch, this program doubles as a word processor.

Design your own will with Haba Solutions: Wills ($49.95). Several standard wills are included for single, married, male, female, etc. You can't cheat death, but you might cheat your attorney out of a fee.

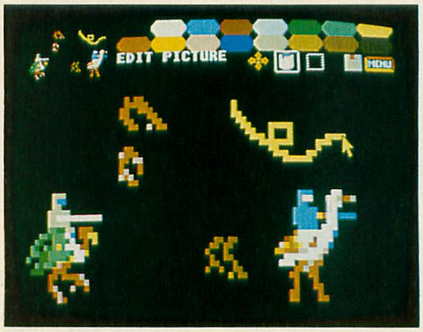
Haba Systems, 15154 Stagg Street, Van Nuys, CA 91405. (800) HOT HABA; in California (800) FOR HABA.

PHILON BASIC

Philon has been developing compilers for the 68000 for some time. However, their first product for the ST, is a BASIC interpreter. Philon BASIC is a subset—and forerunner—of their more powerful and advanced compiler, Philon FAST/BASIC-M. Philon BASIC offers full syntax compatibility with the compiler BASIC, so programs may later be easily transferred to the more sophisticated programming environment. Features include multi-line, user-defined functions, sequential files, a library of predefined functions and a full range of control statements.

$49. Philon, Inc., 641 Avenue of the Americas, New York, NY 10011. (212) 807-0303.

UTILITIES



C.O.L.R. OBJECT EDITOR

This is the Antic Catalog's first professional ST program. Designed by Rugby Circle as an in-house graphics utility for development of Joust on the ST, C.O.L.R. Object Editor is not really "paint" software, but a programmer's tool which creates source-code byte arrays of "sprite" images for use in various languages. It also allows access of picture files created by other ST graphics programs.

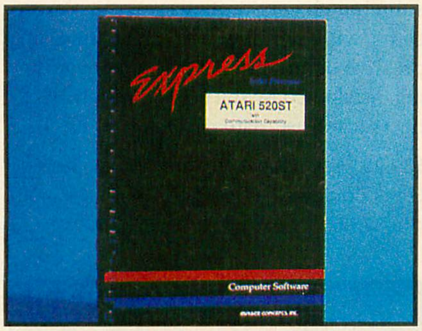
$29.95. Antic Catalog, ST201.

DISK LIBRARY

Disk Library is a disk cataloging utility that will organize and keep track of all your files and programs. You can insert comments on any file at any time and search your library by date, filename, size, extender, or any word or words in the comment string. You may also sort your files and print the library using the same categories.

$39.95. Extended Software, 11987 Cedar Creek Drive, Cincinnati, OH 45240. (513) 825-6645.

applications



EXPRESS

Another first: the earliest ST application software. Express is a letter and small documents processor. Originally designed for the Macintosh and IBM PC, Express was adapted for the Atari ST within an incredible *three weeks*! The package includes a simple word processor and a customized database for easy-to-create mail merge documents.

The ST version was given an extra bonus. After the authors monitored SIG*Atari, they added a terminal program capable of uploading and downloading text files (but not binary). In addition, since files created with Express contain no special printer control characters, the program can be used as a text editor for C or machine language source code.

$49.95. Mirage Concepts, 4055 W. Shaw, #8, Fresno, CA 93711. (800) 641-1441; in California (800) 641-1442.



PORTFOLIO, DEGAS, HOMEPAK

Batteries Included has been busy (as usual) and offers the following three programs for the ST.

Portfolio ($249.95) is written by Lee Isgur, First Vice President of Paine Webber. It's designed for private investors or broker analysts who need information management support to make more efficient decisions. Portfolio gives advice on what to sell and when. It includes a "suppose/what if" forecasting module and terminal software to get you on-line with Dow Jones.

DEGAS ($39.95), which stands for Design and Entertainment Graphics Arts System, is a paint program written by Tom Hudson. It operates in all three of the ST graphics modes and is extremely simple to use. All of its key functions can be user-defined and include brush patterns, fill patterns, colors, and fonts. (Yes, FONTS!)

The popular HomePak ($69.95), by Russ Wetmore, has been adapted to the ST. This is a brand new HomePak. Its strongest feature is still its terminal program, but the database module has been improved with increased memory and the word processor has been enhanced.

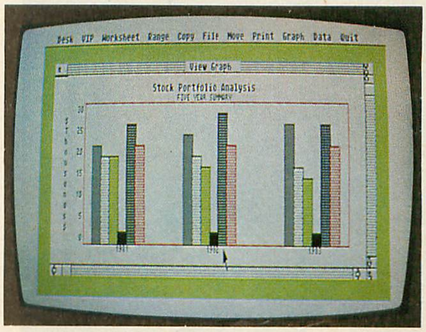
Batteries Included, 30 Mural Street, Richmond Hill, Ontario, L4B 1B5 Canada. (416) 881-9941; in California (416) 881-9816.

CHAT

This is the first available ST terminal program with XMODEM file transfers. Wynne Rostek at SST Systems knew there were plenty of new ST owners starving for a good terminal program, so he rushed Chat to the market. The program doesn't look rushed—and we've seen it at work.

Chat offers ASCII file transfers using XON/XOFF protocol, XMODEM transfers of any kind of file, and you can upload messages and email on CompuServe. It works with dumb modems and Hayes-compatible smart modems, and operates in all three Atari ST resolutions. Most commands require only a single keystroke. And get ready for the price. . .

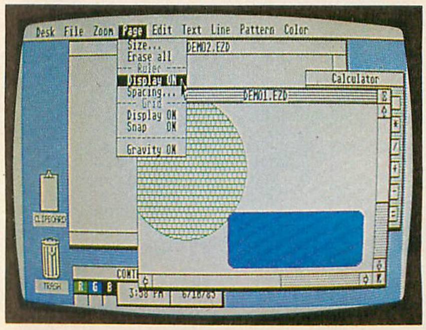
$19.95. SST Systems, P.O. Box 2315, Titusville, FL 32781. (305) 269-0063.



VIP PROFESSIONAL

The VIP Professional is an integrated spreadsheet package which is identical to Lotus 1-2-3 in features and commands. But VIP takes advantage of the Atari ST's advanced features by providing enhanced graphics and an easy-to-use interface. Special details include a 4X magnified spreadsheet and enhanced database characteristics.

$149.95. VIP Technologies, 132 Aero Camino, Santa Barbara, CA 93117. (805) 968-4364.



EASY-DRAW

This is the first in a series of graphics software from Migraph. Easy-Draw includes multiple drawing windows, user-defined patterns, sophisticated zooming, and a pop-up drawing menu. Easy-Draw—which is also designed for impressive hardcopy printouts—is to be followed by Dra-Write, an integrated text/drawing proces-

ST SHOPPERS GUIDE

sor, scheduled for release in the first quarter of 1986.

$99.95. Migraph, Inc., Consumer Applications Division, 720 S. 33rd Street, Suite 201, Federal Way, WA 98003. (206) 838-4677.

LIFE ORGANIZER, ENTERTAINMENT JACKPOT

Life Organizer is a collection of household-level business application programs. Included is a 64-column by 192-row spreadsheet with 20 templates, an outline processor, filing program, decision maker, and more. Entertainment Jackpot contains 14 programs including Checkers, Othello, Cribbage, 3-D Tic-Tac-Toe, an advanced "Eliza" called Therapist and a covey of casino games. It also has three adventure games—two with animated graphics—and an adventure creator program with a three-phrase machine language parser. The programs, which are all written in BASIC, may be listed and examined.

$34.95 each. Martin Consulting, 94 Macalester Bay, Winnepeg, Manitoba, R3T 2X5 Canada. (204) 269-3234.

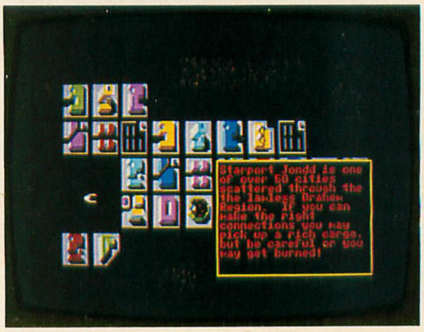
GAMES

A MIND FOREVER VOYAGING

Trust Infocom to get out the first game for the ST. A Mind Forever Voyaging (AMFV) is also the first Infocom game to use 128K of memory. It was written by Steve Zeretzky, co-author of "Hitchkiker's Guide to the Galaxy" and author of "Planetfall" and "Sorcerer." AMFV is set in the year 2031. You have just been given the traumatic news that you are a robot, and all those happy memories of human childhood were nothing but implants. A global crisis is brewing and you have a mission . . . AMFV is the first in a new series of "Interactive Fiction Plus" titles. The series uses a new development system and an increased vocabulary of 1,700 words.

Infocom has also released all of their previous titles for the ST. If you haven't tried an Infocom adventure, you owe yourself the pleasure. Any one will do, they're all good.

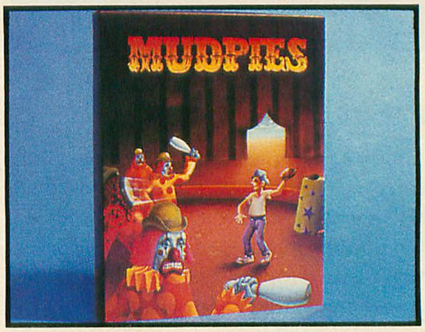
$44.95. Infocom, 55 Wheeler Street, Cambridge, MA 02138. (617) 492-6000.



SUNDOG

SunDog: Frozen Legacy, a big hit with the Apple crowd, is receiving some graphic enhancement for the Atari ST. Described as a "ZoomAction Adventure," Sundog is a high-tech, sci-fi, fantasy role-playing game with windows. At press time, impressive demo disks of the game were being distributed by the company, which expects a release date of October 1985.

$39.95. Accolade Software, 20863 Stevens Creek Boulevard, Cupertino, CA 95014. (408) 446-5757



MUD PIES, FLIP SIDE

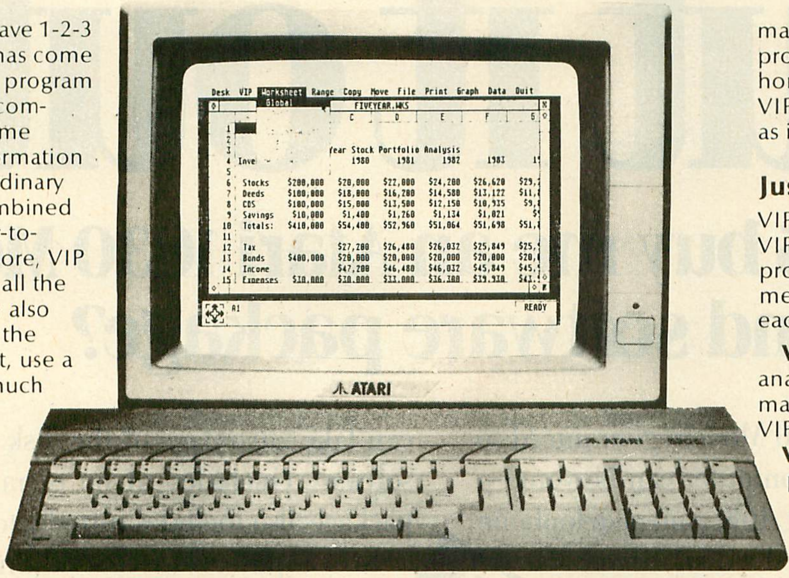
Mud Pies ($24.95) is an arcade game featuring Arnold the mischievous mud-pie flinger and a circus full of chaotic clowns. Flip Side ($34.95) is a form of Othello for the ST. Besides games, MichTron is releasing an IBM/Atari file transfer utility, a RAM-disk, and a communications program called MI-TERM.

Michtron, 576 S. Telegraph, Pontiac, MI 48053. (313) 334-5700.

VIP Professional™

We Jazzed Up Lotus 1-2-3™ For Your Atari ST™

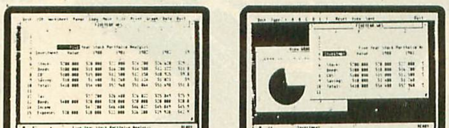
The universal dream - to have 1-2-3 power on your Atari ST - has come true. VIP Professional is a program identical in features and commands with 1-2-3. The same spreadsheet analysis, information management and extraordinary business graphics. All combined in one easy-to-learn, easy-to-afford package. What's more, VIP Professional not only has all the features of 1-2-3, you can also type the same keys to do the same things. Or better yet, use a mouse to make it all so much simpler.



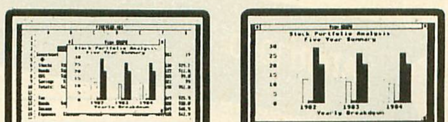
Not Just 1-2-3 in Mouse Clothing

VIP Professional is totally faithful to the 1-2-3 standard. In fact, you can use "1-2-3" files created with Professional with 1-2-3 itself, or with versions of Professional on the Apple //, the Macintosh, the Commodore Amiga, IBM's, even UNIX computers. But like the ST itself, Professional also has the spirit of a daring maverick. Just as the ST outstrips the power and performance of the business computers, VIP Professional meets and out-features Lotus. Compare for yourself:

Feature	VIP	1-2-3
123 Commands	Yes	Yes
123 Graphics	Yes	Yes
123 Database	Yes	Yes
123 Macros	Yes	Yes
123 Files	Yes	Yes
Enhanced Graphs	Yes	No
Uses mouse	Yes	No
Drop-Down Menus	Yes	No
Icons	Yes	No
GEM interface	Yes	No
Multiple windows	Yes	No
Available on ST	Yes	No
Easy to use	Yes	No
Affordable	Yes	No



VIP Professional will do your finances, keep your inventory, graph your sales, and a whole lot more.



A New Gem™

VIP Professional is easy to use because it takes advantage of the GEM environment and other elegant features built into the ST. Throw in lots of help, a thoughtful tutorial for the novice, and a thorough reference manual, and you have the makings of the perfect powerhouse product for the office, school and home. And at the super low price, VIP Professional is as easy to afford as it is to use.

Just a Hint of Things to Come

VIP Technologies is on the move. VIP Professional is the first of several products for your ST under development, all of which will interact with each other. Expect to see soon:

VIP Analysis™-A statistical and analytical tool to integrate and manage information created with VIP Professional or Lotus 1-2-3.

VIP Freelance™-A complete text processor with full formatting capabilities, plus a complete workbench of writer's tools.

VIP Consultant™-A project management program to help design, organize and implement any complex task at hand.

VIP Forethought™-An outline processor useful for organizing any mental activity.

Our software will make your ST investment one of the best you have ever made.

123 Power Without the 123 Price:

$179.95

For Product Info or the name and location of your nearest dealer,

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VIP TECHNOLOGIES

132 Aero Camino, Santa Barbara, CA 93117

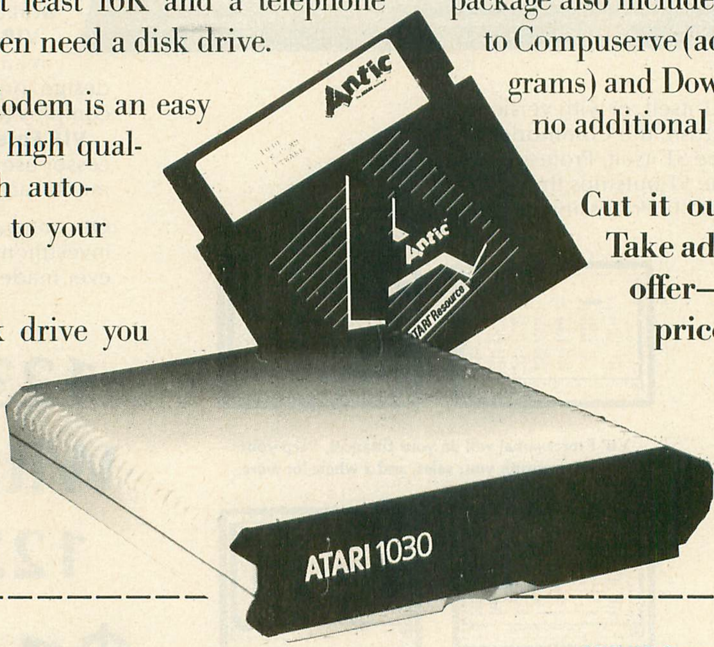
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800 772 3545 X133 (inside CA)
California residents add 6½% sales tax.
Add shipping charges of $2.75 per modem.

Canadian residents please send U.S. dollars.
Allow 2-4 weeks for delivery.
Prices subject to change without notice.
Delivery subject to availability.

4xFORTH

First serious language for ST users

by RON BRAITHWAITE

4xFORTH is a full-scale implementation of the Forth language for Atari ST computers. This product has been used successfully in process control, robotics and similar applications on the MC68000 microprocessor for the past three years—and on the Digital Equipment Corp. PDP-11 minicomputer even before that.

4xFORTH will run on an ST with a single disk drive, and on either a medium-resolution color monitor or high-resolution monochrome monitor. The 4xFORTH editor will not run properly on a low resolution display, although applications written in 4xFORTH can use low resolution.

UNDERSTANDING FORTH

If you haven't programmed in Forth, let's start with a little bit of background about how the language works.

Programming in Forth involves creating procedures called words. A Forth word is placed in the dictionary after being defined by its relationship to other words.

Two completely different words can have the same name in Forth, with the most recent word being the one found when looked up in the dictionary. It is possible to have two different words with the same name active at different times, depending on their context.

For example, the word FISH might have two different meanings. If FISH is used as a noun, it refers to a creature that lives in water. If FISH is used as a verb, it refers to an attempt to catch the elusive little beastie.

The way these distinctions are made in Forth is with the vocabulary structure. Its usage is like this:

```
VOCABULARY NOUNS / create the NOUNS vocabulary
VOCABULARY VERBS / create the VERBS vocabulary

NOUNS DEFINITIONS / Place new words in NOUNS
:FISH ." Critter that lives in the water." ;

VERB DEFINITIONS / Place new words in VERBS
:FISH ." Catch the critters living in the water." ;

NOUNS FISH critter that lives in the water.

VERBS FISH catch the critters living in the water.
```

HANDLING FILES

Up to eight files may be open at the same time with 4xFORTH. The files may be opened with the options of Read Only, Write Only, or Read/Write. When files are opened, they must be assigned a word which parses the file name into a form that GEMDOS accepts. Then the file is assigned a channel number and its open options. For example:

```
$FILE BMAIN B: FORTH.BLK"

1 BMAIN 2 FOPEN
```

This creates an entry for the file name B:FORTH.BLK and then opens the file using channel 1 with Read/Write (the 2) attributes. Files can be created with Read/Write, Read Only, Hidden, System/Hidden, and Volume Label attributes.

For those not familiar with it, the primary Forth primitive for dealing with mass storage is BLOCK.

Forth divides mass storage in 1024-byte blocks, allowing for very fast random access. This method gives the programmer absolute freedom to create whatever structures are needed, without the overhead of unneeded structures. But because the program editor treats a block as 16 lines of 64 characters, leaving a blank line in the middle of a block leaves 64 bytes of spaces which can create very bulky files.

The Dragon Group told me they would provide a utility to load files edited with non-Forth editors, such as Mince. This should solve the space problem. But you lose much of the interactive nature of Forth if you must exit to edit your program files.

A very nice feature of 4xFORTH is its support of a RAM-disk. This means unused memory can be allocated and used as an electronic disk drive which is much faster than either a floppy or hard disk—although when the power

continued on page 53

continued from page 51

is turned off, of course, the contents of the RAM disk are lost. To use the RAMdisk, simply enter:

<#blocks> SET.RAMDISK

Blocks from the currently selected file can be copied from the file to the RAMdisk with F>R and, when finished with the RAMdisk, they copy back to the file with R>F.

A highly advanced feature of 4xFORTH is its built-in support of satellite processors. This means a second ST—with or without disk drives—can be attached to the serial port. The implication here is that 4xFORTH can support a Local Area Network! However, this subject is a little too complex for further detailing in a review.

The 4xFORTH editor will work with the mouse for cursor positioning. The left mouse button moves back a block and the right mouse button moves forward a block—the blocks are first saved automatically.

In 4xFORTH, it is unnecessary to keep track of exactly where different words are defined. The editor also supports use of the function keys, with control key sequences for additional functions.

GRAPHICS

The graphics system has Tektronix 4010 emulation. This is important, because more software has been written for the 4010 series display terminals than for any other graphics display. Source code written for Tek 4010 displays can be easily converted.

The graphics system is very well developed, with primitive routines such as GET.PIXEL, PUT.PIXEL, DRAW.LINE, Tek 4010 emulation routine MOV, RDRW and complex routines like RECTANGLE, POLYGON, +SPRITE, –SPRITE, and much more.

A full GEM interface has been promised for the level 2 version of 4xFORTH.

THE ASSEMBLER

Commercial Forth packages have assemblers that vary greatly in quality and documentation. But like everything else I have seen so far from the Dragon Group, their 4xFORTH assembler is first-rate.

The manual's Chapter Five provides an excellent discussion of programming in assembler on the 68000. There is a very complete discussion of addressing modes and instruction set features. Overall, it is the best documentation of a Forth assembler I have ever seen.

This is not to say the chapter is a complete introduction to programming in assembler. Like the rest of the manual, it assumes that the reader is an experienced all-around programmer, familiar with a variety of languages and processors.

The assembler itself has very complete error-checking for illegal addressing moves and other quirks of the 68000. As anyone who has attempted to program the 68000 in assembly language can attest, this processor has more than its share of idiosyncracies. The assembler helps watch out for them.

MULTI-TASKING

4xFORTH comes with a built-in multi-tasker. This means that although the ST cannot do two things simultaneously with GEMDOS—with 4xFORTH it can!

4xFORTH multi-tasking uses a cooperative round-robin scheduler that is very clearly documented, with a good comparison of time slice versus round-robin techniques.

Needless to say, this is another very complex subject. Yes, you can run a two-user system on the ST—simply by connecting a terminal to the serial port. However, for anything more complex, be prepared to deal with ST system internals.

PERFORMANCE

4xFORTH is *fast*. . .

Since the heritage of this language is control of time-critical processes, great effort has been made to optimize performance. This is reflected in speed of execution. Under 4xFORTH the 520ST does one pass of the Sieve of Eratosthenes in 1.1 seconds. (*In the October, 1985 issue, **Antic** clocked this test at 3.8 seconds for an ST running Digital Research C. The fastest time tested was 1.97 seconds for a minicomputer using C on UNIX.*—ANTIC ED)

And if this is not fast enough, there are also two optional Accelerator packages which greatly increase the speed, at minimum penalty in program size.

This is the fastest version of Forth that I have ever seen.

THE MANUAL

With complex software such as a programming language, the quality of the manual is virtually as important as the quality of the program itself. From my point of view as a professional programmer, I am pleased to say that both are extremely well done.

But there are some problems. The manual can overwhelm a novice programmer, as can any language technical manual. A more serious problem is that there are a number of words in the kernel (the base system) which are not documented. This can be justified, I suppose, under the argument that the undocumented words are internals which should not be used.

The authors realize the problems of complexity in the manual and address it by suggesting the novice read Leo Brodie's classic books, "Starting Forth" and "Thinking Forth." In addition, I recommend Anita Anderson and Martin Tracy's "Mastering Forth" and Margaret Armstrong's "Learning Forth." All these books are available from the Forth Interest Group, P.O. Box 8231, San Jose, CA 95155. FIG also offers Forth Dimensions magazine, a must for every Forth programmer.

(***Antic** wants to re-emphasize that 4xFORTH was primarily designed as a tool for professional software developers already familiar with the Forth language. Understanding the 4xFORTH documentation can be quite difficult without this advanced level of technical expertise.*—ANTIC ED)

continued on next page

PROBLEM AREAS

Although this system is intended for proessional development, there are some frustrating shortcomings.

- There is no binary save. The source must be reloaded each time an application is to be run. The Dragon Group plans on providing this essential feature in the near future.
- There is no target compiler. A target compiler allows you to generate a minimal system for a specific applicaton, at the cost of increased complexity. The Dragon Group is promising an overlay mechanism and that may be sufficient. But until this feature and the binary save are available, commercial applications are not feasible.
- There are a number of undocumented words in the system, plus a number of words missing that are specified in the Forth 83 Standard. Not many, but enough to be frustrating.
- The editor is included in the kernel. This occupies space that could otherwise be used by an application.
- A number of features (such as the RAMdisk) are discussed in one part of the manual, but not listed in the index.
- There is no decompiler or step-wise debugger. These important features are part of the F83 Public Domain model (available on CP/M, CP/M-86, MS-DOS, and CP/M-68K). There are a number of other features in F83 that should be implemented as well. The F83 model is one which vendors should pay attention to in their implementations.

Although these problems are annoying, they are not fatal flaws.

CONCLUSIONS

The Dragon Group has created an excellent version of Forth in this product. 4xFORTH is incredibly fast and has many of the tools and extensions needed by the software engineer.

Despite some shortcomings, the quality of the software and the manual make this a system that novice programmers can use to learn Forth. At the same time, 4xFORTH is ideal for the professional, once some minor flaws are fixed.

I believe that 4xFORTH is the most advanced programming environment available on the Atari ST so far.

4xFORTH
Dragon Group
148 Poca Fork Road
Elkview, WV 25071
(304) 965-5517
$99.95

Software engineer Ron Braithwaite is currently the Forth group leader for Rising Star Industries, developing the Valdocs applications software series for the Atari ST and other computers.

INTRODUCING 520ST ASSEMBLY LANGUAGE

MC 68000 tutorial

by CHRIS CHABRIS

To a programmer, the most important feature of any computer is its "brain," the central processing unit (cpu). And the Atari 520ST sports the most advanced cpu ever put into a personal computer—the 16-bit Motorola MC68000 microprocessor running at a clock speed of eight megahertz.

My first encounter with the 68000 occurred in a course on systems programming that I took last year at Harvard. Having learned machine language on the 6502 microchip in Atari's 8-bit computer line, I was pleasantly surprised. The 68000 instruction set seems like a high-level language, compared to the 6502.

Using a Macintosh computer, we constructed several large programs in 68000 assembly language, including an assembler, spreadsheet, and language interpreter. But then when I returned to an Atari 130XE, writing simple utilities seemed like using knives and bearskins to build a computer.

68000 FAMILY

What is it about the 68000 that makes the trusty 6502 seem so crochety? Before we can answer that question, we must clarify what we mean when we say 68000.

In 1979 Motorola introduced a new family of general purpose microprocessors with the 68000 chip. (In the May, 1985 **Antic**, *Meet the 68000* provides a basic description of the 68000 itself.) Although code written for the 68000 is compatible with all subsequent chips, there are some significant variations within the family:

- The 68008 is a version of the 68000 that addresses only one megabyte of memory and uses an 8-bit data bus. It transfers data, to and from memory, one byte at a time instead of two. This chip is used in the Sinclair QL computer.
- The 68010 has a few additional instructions, operates faster in certain loop situations and supports virtual memory. Part of the address space is stored on external mass storage and "paged" in and out of main memory in order to simulate larger contiguous RAM than actually exists. This chip is used for running Unix in the AT&T 7300 PC.
- The 68020 is the true 32-bit version of the 68000, with data and address busses both 32 bits wide. It also supports the 68881 floating-point co-processor and many additional instructions. A so-called instruction cache holds the next intructions to be executed within the processor, so they do not have to be fetched from main memory each time.

68000 OVERVIEW

We can familiarize ourselves with the power of the 68000 by examining a simple program in excruciating detail. But if you have never seen 68000 assembly language before, there are a few things you need to know first.

Within the 68000 chip are eight general-purpose data registers—each 32 bits wide—labeled D0-D7. They can act like either the accumulator or the index registers in the 6502. There are seven 32-bit-wide address registers labeled A0-A6, and a 32-bit stack pointer labeled A7 or SP. The stack pointer points to an absolute address in the computer's memory, unlike the 6502 stack pointer which is an 8-bit offset to address $0100.

The 68000 instructions can operate on either a 8-bit byte, a 16-bit word, or a 32-bit longword. Bytes can be located at any address, but words and longwords must begin at even addresses. The size is denoted by affixing either a ".b", ".w", or ".l" to the instruction mnemonic, as in **CLR.W D0**, which would clear, or set to zero, only the first 16 bits of register D0.

SAMPLE PROGRAM

Armed with this information, you should look at the listing in *Figure 1*. This is a short subroutine that computes

continued on next page

the sum of the first N even natural numbers—or 2+4+ . . . +N.

As the header comments indicate, the parameters are passed to and from the subroutine in the data registers.

Figure 1

```
; Compute the sum of the first N even natural numbers.
; N is passed in register D0, and register D1 will
; contain the intermediate and final results. Method:
; the first N numbers are summed by counting down D0
; and adding its value into D1 until D0 reaches zero.
; Then D1 is multiplied by 2.

evensum:    clr.l    D1        ;Zero-out
                               ;Accumulator

sumloop:    add.l    D0,D1     ;Add current
                               ;counter value to accumulator

            subq     #1,D0     ;Decrement
                               ;counter by one

            bne      sumloop   ;until it
                               ;reaches zero

            muls     #2,D1     ;Double sum to account
                               ;for even numbers

            rts                ;Return
                               ;to caller
```

D0 on entry contains the number of numbers to add, and D1 on exit will contain the result. Note that the subroutine does no error checking. So if the first N even natural numbers cannot be summed in a longword (the maximum size of D1), an incorrect result will be returned.

The program begins by clearing out register D1.l. (This notation references D1 as a longword. D1.b, for example, would indicate the first eight bits of D1.) Note that with the 6502, this 2-byte instruction could only be roughly simulated with well over 10 bytes of code!

Now the loop begins. In the loop, the program must add the value of register D0 to D1 and decrement D0 until it reaches zero, an algorithm which is executed by three instructions.

The first instruction adds D0 into D1 using the ADD instruction. Like most 68000 instructions, ADD takes two operands of any size: source and destination. Although both operands are data registers, in this case only one need be. Special variations on the ADD instruction—ABCD, ADDA, ADDI, ADDQ, and ADDX—take care of most other addressing situations and give the 68000 great arithmetic flexibility.

The SUBQ instruction is used next to decrement counter D0 by one. SUBQ is a special form of SUB. It only operates on longwords and subtracts an immediate value from 1 to 8 from the second operand. However, it is faster and more compact than the standard SUBI instruction, which can handle immediate operands of any size.

6502 hackers will find the familiar BNE instruction at the bottom of the loop, and it indeed acts just as its 6502 counterpart. It is one of a family of 15 branching instructions available on the 68000, each of which uses a word-size displacement. The address referenced in a branch instruction can occur up to approximately 32K bytes before or after the instruction itself.

The loop has ended, but one essential task remains. The accumulated sum must be doubled to account for the sum of the even numbers.

This is accomplished by the powerful MULS instruction, which here multiplies two by the value in D1 and stores the result in D1. 6502 fans will note that the same thing can be accomplished on that chip with the ASL and ROL instructions. But what if we wanted to sum all the natural numbers counting by, say, 27? With the 68000, we just change the first MULS operand to 27. On the 6502 we would have to rewrite the loop, or code a complicated multiplication algorithm.

No subroutine is complete until it returns to its caller. Like the 6502, the 68000 does this with the RTS instruction. But unlike the 6502, the 68000 has different ways of getting to the subroutine in the first place: JSR (Jump to SubRoutine) and BSR (Branch to SubRoutine).

JSR operates on any address, and BSR operates on a 16-bit signed displacement—just like the branch instructions discussed earlier. No matter which instruction is used, control is returned with the same RTS instruction.

I hope this short program shows you how easy it is to program in 68000 assembly language, and how similar the 68000 actually is to the 6502. Although my article stressed the differences between the two chips, any dabbler in 6502 assembly language will have no trouble learning the intricacies of the 68000.

*Chris Chabris used to be a very active writer for **Antic**, but this is the first article he's had time to work on since entering Harvard University as a computer science major last fall.*

BOOK LIST

M68000 16/32-bit Microprocessor Programmer's Reference Manual
(Fourth edition)
by Motorola.
Prentice-Hall, 1984
Englewood, NJ

Motorola Data Sheets:
68000—#AD1-814
68008—#AD1-939
68010—#AD1-942

Programming the M68000
by Tim King and Brian Knight
Addison-Wesley, 1983
Reading, MA

The Motorola MC68000 Microprocessor Family
by Thomas L. Harman and Barbara Lawson.
Prentice-Hall, 1985
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68000 Assembly Language Programming
by Kane, Hawkins, and Levanthal
Osborne/McGraw-Hill, 1984
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The 68000: Principles and Programming
by Leo J. Scanlon
Howard W. Sams & Co., 1984
Indianapolis, IN

ST LOGO EXPLORATION

Mapping uncharted memory

by FRED HATFIELD

When you buy a computer that's too new to have detailed technical documentation available, it's up to you to find out whatever you can about the internal features. The Atari 520ST comes with two manuals. One is an attractively illustrated users guide that gets you started with the drop-down menus and selection of optional features, etc. The second manual is entitled "Sourcebook for Atari Logo" and describes technical features of Logo, the only language currently provided with the ST.

One of the tried-and-true approaches for exploring an undocumented computer is to find some way of looking at memory storage locations. Once you can look at memory, the "brute force" method of figuring out what's going on is to print out the biggest possible hexadecimal dump of memory you can manage. Then you sit down and look for obvious patterns, I/O control blocks, object code, messages, etc.

While scanning the Logo sourcebook, I noticed a primitive called .EXAMINE n that displays contents of absolute memory location n as specified by the input number. Terrific! There should be a matching .DEPOSIT n and sure enough there was! Now we could look for the best spots in the "fishing hole."

By experimenting, I discovered the .EXAMINE n limits were between $00800 and $7FFFF. (No, that's not an extra F—you're working with 24 bits now.) I won't worry about that yet, I thought. All I want *now* is a "quick and dirty" way to read and print out memory

A simple loop finds that you can enter two addresses for start and stop locations and get data out:

```
TO DUMP  :START  :STOP
IF (:START >= :STOP) [STOP]
[TYPE .EXAMINE :START TYPE [# ]
DUMP  :START  :STOP]
END
```

A more useful format would consist of the address followed by 16 successive byte values, as is the case with most standard dump formats.

Since Logo is more suited for graphics, it began to look as if necessary arithmetic routines (such as binary to hex conversion) would consume too much programming time.

LOGO HEX

Once again I thumbed through the ST Logo Sourcebook. This time I discovered a way to convert binary to hex by string substitution instead of by arithmetic. After all, we're only working with 256 possibilities, so a string substitution table doesn't take up too much of a 512K memory.

Sure enough, there was an operation called PIECE which was just perfect for what I wanted to do. A previously defined string could be used for supplying the desired two hex digits in ASCII. The value of the memory contents would define the decimal position of the two-character ASCII pair desired.

I immediately built two strings, one called :HEX1 and the other :HEX2 (clever, no?). :HEX1 had the string value "000102030405 . . . 7D7E7F" and :HEX2 had the rest of the combinations, "80818283 . . . FDFEFF". like so:

```
?TO INIT1
>MAKE "HEX1 "0001020304
05060708090A0B0C0D0E0F1
0111213141516171819 1A1B
1C1D1E1F202122232425262
728292A2B2C2D2E2F303132
333435363738393A3B3C3D3
E3F40414243444546474849
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55657585955A5B5C5D5E5F60
6162636465666768696A6B6
C6D6E6F7071727374757677
78797A7B7C7D7E7F"
>END
```

Now let's test it by outputting an actual two-character string just as we would want to do with the finished program.

We'll call it PRNT1 since it prints all values from 00 to 7F, depending on the value of the two decimal digits following the PIECE command:

```
TO PRINT1 :A
MAKE "HCHR PIECE :A+1 :A+2 :HEX1
TYPE :HCR
END
```

Then, when you test it by typing PRNT1 32 [RETURN] it responds with:

```
20
?
```

These are the 33rd and 34th characters in the :HEX1 string—and also the hex representation of 32 decimal.

Now the remaining job is to design a procedure that calls the proper PRNT routine, depending on the value of the input variable :A. This means testing :A on entry and determining if its value is above (80 hex—128 decimal) and then calling the proper PRNT routine. Since the positions in :HEX2 are the same as :HEX1, we can compensate by subtracting 128 from all values equal to or greater than 128. The only difference between :HEX1 and :HEX2 are the contents of the strings stored there—:HEX2 values are 128 higher, but in the same relative positions as :HEX1 values.

PRNT CALL

Since the strings are *two* characters for every value, the input value :A will have to be multiplied by two somewhere. Why not do it at the beginning of the routine where we test the value above or below 128? Then you won't have to worry about it afterwards. All we have to do is double it immediately, then double the test for above or below 128—so now we test for values above or below 256.

In the end, for reasons of modularity, I broke up the strings into 8 groups of 64—:HEX1 through :HEX8, each containing 64 two-digit representations of hex values.

When the input routine PRNT receives the decimal value to be printed in hex (:B), it also receives a character count (CNT) indicating how many two-character hex representations to put on a line. The version here is 16 since that is an easy number to step in hexadecimal and the memory map representation is neater and easy to use. 16 characters to the line will also leave enough blank space on the right hand margin to make notes and draw identification arrows with copious valuable (hopefully) information.

However, if you should desire to cut your paper consumption in half by putting 32 characters to the line (or even 64 in compressed Epson print) it is easy enough to change the 16 value passed by DUMP into the value desired. But *don't* forget to also change the address incrementing value following the PRNT call. Otherwise, your address identifications on the first line will still be incremented by the previous value.

A note about PRNTZ. Each PRNT routine converts the requested decimal value to a two-character hex representation. That value is stored in variable :HCHR (Hex Character). It may appear that this is wasteful, since the value could be printed immediately at conversion. But by storing it in :HCHR, later versions of the dump will be able to perform smarter functions such as disassembly, memory searching, etc.

Programmers usually call this a "hook" for possible later features. So when the data has been converted by the proper PRNTn routine, all branch to the common PRNTZ location where :HCHR is printed to the screen or printer. When control returns to PRTLN9 (in routine PRTLN2), there is a command to PRINT [ ]—which is really there to supply a carriage return/line feed. In the Epson buffered printer, a line is not printed until CR/LF is received, so this simply causes the 16 double characters just sent to the line printer or screen to be displayed.

TYPING IT IN

So to start exploring your ST's memory with Logo, type in Listing 1, DUMP.LOG. Be sure to type INITALL before you RUN the memory dump.

The program is stopped by pressing [CONTROL] [G]. If you just want to pause, press [CONTROL] [Z]. Type CO to continue everything from where it left off.

I discovered that this program is slow enough so that any additional tinkering might bring it to a discouraging crawl. I usually started it in the evening and let it run all night. The beginning of any computer system analysis is going to be slow and monotonous. But once you have developed this primitive tool you'll see some rapid gains.

Fred Hatfield is a New Orleans programming consultant. He wrote Reader's First ST Program in last month's Antic.

Listing on page 94

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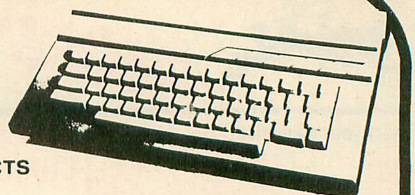
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continued from page 27

Type **DIR** [RETURN] to see an alphabetized DIRectory of files. If you have more than one drive, place the number of the drive directory you wish immediately after the command: **DIR2**.

Once a disk drive number is specified, that drive becomes the "default" drive. For example, after typing **DIR2**, all commands—including **DIR**—will affect drive 2.

By adding a **/P** (slash P) after the command, you can send the directory of any drive to a printer. You may also specify a filename: **DIR3/P*.OBJ** will send all files on drive 3 with .OBJ extenders to the printer as well as to the screen.

FORMAT

FORMAT will format the default drive. You may format another drive by placing the drive number immediately after the command. A disk in a 1050 drive defaults to enhanced density under DOS 2.5. Should you wish to Force the format to single density, type **FORMAT/F**. As with most DISKIO PLUS commands, you will be prompted to verify this command by pressing [Y]. (Old-time DISKIO users should note there will be only *one* prompt).

DOT COMMANDS

Five of the one-dot commands use identical parameters to the **.K** lock command described above. They are: **.U**, Unlock; **.S**, Save; **.E**, Enter; **.L**, Load; **.R**, Run. In each case, you may specify the filename, or the device and filename. If the directory is showing, you can also specify the file reference number.

Use **.N** to reName files. This is a little different from other dot commands because it requires you to enter a new name for your file. The filename parameters, however, are identical to other dot commands, followed by a space and the new filename. For example:

.N6 NEWFILE.TXT.

DISKIO PLUS will not allow you to create duplicate files. Since the directory is alphabetical, you should re-list it after renaming a file because the files may now be in a different order with altered reference numbers.

To LIST a file to the disk, use the **.X** command. With this command, you may also specify starting and ending line numbers. Should you wish to LIST a file from a particular line number to the end of the file, sandwich the line number with commas: **.X7,360,**.

You may LOAD Binary files from DISKIO PLUS with the **.B** command. No check is made to see what the Binary file might write over, so this could cause a crash. Should you wish to LOAD—but not RUN—the Binary file, append **/N** (slash N) to the command. If the file specified is not Binary, the LOAD will be aborted.

MOVE COMMAND

The Move command has many options, but we're always Moving a file, or files, from a "source" to a "destination."

Let's look at some examples. To Move reference-numbered 6 file from drive 1 to drive 2, where drive 1 is the default drive: **.M6/2**. You can also type:

.MMYFILE.BAS/2
or **.MMYFILE.BAS D2:MYFILE.BAS.**

You can change the destination filename:

.M6 D2:NEWFILE.BAS
or **.MD2:MYFILE.BAS D:NEWFILE.BAS.**

As previously mentioned, you can use wild cards on file Moves: **.M*.OBJ/2**.

When using a single disk, you will be prompted to insert your source and destination disks. These prompts will also work with wild-card multiple file Moves.

By adding **/S** or **/P** to the Move command, you may Move the chosen file to the screen or printer. **.M6/S** Moves file #6 to the screen. **.MMYFILE.LST/P** prints the BASIC file, MYFILE.LST to the printer.

Naturally, only a text file or LISTed file will make much sense. But you can disable screen control characters during a screen print by adding 1 to the **/S** extender: **.MTREE.PIC/S1**.

TURNING IT OFF

Caution! DISKIO PLUS can get in the way of string input in BASIC programs. While inputting a string, DISKIO PLUS will act upon any input that can be interpreted as a DISKIO PLUS command.

For example, suppose your program prompts you for input and you type in DIR while DISKIO PLUS is active. DISKIO PLUS will print a DIRectory.

Luckily, it's easy to get rid of DISKIO PLUS. Type **OFF** to disable it, and type **ON** to bring it back. Type **OFF** and press [RESET] to permanently disable DISKIO PLUS.

[SYSTEM RESET], by itself, will not affect DISKIO PLUS.

You may also disable DISKIO PLUS from your program by POKEing location 10592 with a 255. POKE the same location with a zero to turn it back on.

DISKIO PLUS takes up some of your RAM and there are times when you need all the memory you can get. To get full memory, permanently disable DISKIO PLUS, as described above. Type DOS, then return to your cartridge. (Note: this will not work if you are using MEM.SAV).

SPECIAL OPTIONS

BASIC XL has a command I've always liked, so I added it to DISKIO PLUS so other languages could use it. **LIST**, or **L.**, followed by a line number and a comma, will LIST the resident program from that line number to its end. Otherwise LIST will function identically to the Atari BASIC command.

You may write whichever DOS is resident to disk by typing **WDOS**. If you wish to write to other than the default drive, follow the command with a drive number.

This function will not work with DOS XL. Also, DISKIO

continued on next page

PLUS will not work with the supercartridge version of DOS XL.

DISKIO PLUS allows you to create as many as three single-key macros.

Let's say we're getting tired of constantly typing PRINT #6;". Instead, we type:

DEF1 P PRINT #6;" [RETURN].

Now, whenever [P] [RETURN] is pressed, our phrase will be printed to the screen. Anytime after defining a macro, type **HELP** and your macro will appear on the screen. You may edit the macros directly on the **HELP** screen.

Your macros can call other macros, or call DISKIO PLUS commands. **DEF3 D DIR8**, will call the RAMdisk directory on the 130XE whenever [D] is pressed.

Macros are limited to 30 characters, and you can use control characters—but not special control characters such as the screen-clear symbol. Also, the macros are not case-sensitive. Though you may enter key-command and the characters in inverse or lower-case, macros will reappear in normal, upper-case.

You can replace existing macros by redefining them. If you wish to completely delete a macro—DEF1, for example—type **DEF1** [SPACE] [ESC] [ESC] [RETURN].

MACRO FILE MAKER

Listing 2 is a BASIC program which will save any currently defined macros into a one-sector binary file which can be loaded into memory with the **.B** command. This way you can create any number of macro files and instantly load them as needed.

Type in Listing 2, KEYMAC.BAS, check it with TYPO II and SAVE a copy.

Now, create some macros and make sure they're on the HELP screen. RUN Listing 2 which will ask for a filename. Device is optional. An extender of .KEY will be automatically added.

Now, whenever you boot DISKIO PLUS, all you have to do to create your macros is load the .KEY file with the **.B** Binary load command.

Note: Listing 2 will disable DISKIO PLUS during its run, so if you press [BREAK], don't press [RESET] until you've turned DISKIO PLUS back **ON**.

REMINDERS

Remember, DISKIO PLUS commands will react from BASIC string input. So will macro commands—so if you're getting strange results from a BASIC program, turn DISKIO PLUS to **OFF**.

Also, DISKIO PLUS takes up some of your RAM. If you receive an ERROR 2—Out of Memory, you may need to get rid of DISKIO PLUS as described above, in Turning It Off.

Listing on page 86

Original 400/800 Owners Rejoice! CDY Has Not Forgotten You!

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Of course, 400/800 owners can also enjoy the power and convenience of OMNIVIEW (including *SpeedScript 80*)by adding the 4K or 8K OMNIVIEW to the OMNIMON piggyback board or the Ramrod OS board. These OMNIVIEWs also include resident ramdisk handlers for use with the AXLON Ramdisk. If you are serious about enhancing the performance of your computer, you will be delighted with the unique features of OMNIVIEW!

Feature Comparision Chart

	OMNIMON Piggyback	Ramrod OS board	-----Upgrades for-----	---OMNIMON or Ramrod---		Ramrod XL Piggyback	Add-on for Ramrod XL
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Enhanced OS		★				★	★
Includes FASTCHIP FP						★	★
80 Column Emulation				★	★		★
Ramdisk Handlers			★	★	★		★
OMNIMON Features:							
A:Alter Memory	★	★	★	★		★	
B:Boot (Ram) disk			★	★	★		
C:CPU Registers	★	★	★	★		★	
D:Display Memory	★	★	★	★		★	
E:Single Step Execution	★	★	★	★		★	
F:Fill Program Buffer			★			★	
G:Binary Load/Directory			★			★	
H:Hex Conversion			★	★		★	
H:Hex Arithmetic			★			★	
I:Install Ramdisk Handlers			★	★	★		
J:Jump Subroutine (JSR)	★	★	★	★		★	
L:Drive Selection/Control	★	★	★	★		★	
M:Move Block of Memory			★			★	
N:Relocate 6502 Code			★			★	
O:Operate from Prog. Buffer			★			★	
P:Printer Control	★	★	★	★		★	
R/Read Sector(s)from Disk	★	★	★	★		★	
S:Search Mem. for Sequence	★	★	★	★		★	
T:Tog. Hex Char Display Mode	★	★	★	★		★	
U:User's Custom Command			★				
V:Verify 2 Blocks of Memory			★	★		★	
W:Write Sector(s) to Disk	★	★	★	★		★	
X:Disassemble Memory	★	★	★	★		★	
Y:Line Assembler			★			★	
Z:Exit Monitor			★				
Lockup Recovery			★	★		★	
Redirection of Printer I/O			★	★		★	
Talk to Happy Ram Buffer			★	★		★	
80 Column ATRMON for	ATR8000						★
Includes SpeedScript 80				★	★		★

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Free OMNIVIEW for your 400/800!

OMNIVIEW has been steadily gaining in popularity, especially since the introduction of SpeedScript 80 (see left column of this ad). CDY now makes beautiful 80 column screen output even more affordable by providing a 4K OMNIVIEW (including SpeedScript 80) free of charge with every OMNIMON piggyback board sold! And since this OMNIVIEW also has resident ramdisk handlers, it is especially powerful in conjunction with the AXLON Rampower 128, allowing you to interface it with almost any DOS. However, OMNIMON piggyback boards are in limited supply, so order soon to take advantage of this great opportunity. Remember, Christmas is right around the corner! Avoid the rush!

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The following article assumes a sophisticated knowledge of hardware and assembly language. We have taken every step to ensure that the information contained herein is correct, but ***Antic*** *cannot take responsibility for, nor give assistance on, readers' hardware projects.*

—ANTIC ED.

EPROG

by Larry Woodgeard

EPROG (EPROM Programmer) is designed to read or program three popular types of EPROMs: 2716, 2732, and 2764. It consists of an assembly language program and hardware circuitry, and it works out of joystick ports 1 and 2.

The majority of the EPROG circuitry (see *Figure 1*) consists of IC1 thru IC8 which are 4-bit tri-state D-latches. Port 1 does data transfer 4 bits at a time. The 4 bits of Port 2 are used as control signals. IC9 is used as a buffer and signal inverter. The five mode switches SW1 thru SW5 are used to select programming requirements for the three different devices. We also need a power supply to provide +5 volts and +22 volts.

MODES OF OPERATION

There are two modes of operation: Read and Program. The Read mode allows you to read the EPROM into an assigned memory location in the computer. The Program mode lets

continued on next page

WHAT'S AN EPROM?

EPROM stands for Erasable Programable Read Only Memory. Just like the ROM (Read Only Memory) chips in Atari cartridges, an EPROM does not lose its data when the power is turned off. Unlike ROM chips, EPROMS can not only be programmed, they can be *erased* and reprogrammed.

Putting a program on an EPROM is sometimes called "burning." And the hardware that does the job is referred to as an "EPROM burner." The following article will examine how to build an EPROM burner—called EPROG—and how to transfer machine code to the EPROM chip.

The great thing about EPROMs is you can program them to make customized operating systems or cartridges—and load instantly when you boot your Atari. As already explained, EPROMs can be erased and re-used. You erase the EPROM by exposing the little window on top of the chip to Ultra-Violet light for about 20 minutes.

you write data into the EPROM from a selected memory location.

To perform a Read, the ports are first set to an output mode. Then the EPROM must be given the address, enabled, and the data is read into the port. Each address is broken down into 4 nybbles. The highest nybble of the address is presented to port 1 and IC1. Then a clock pulse is applied to all the registers shifting the nybble through IC1. The next highest nybble is then shifted through the same way. Four of these shifts result in the complete address in IC1 thru IC4.

Now, the 4 bits of Port 1 are changed to input mode. A high is applied to RW1 which serves to disable IC1 thru IC6, enable IC7, and enable the EPROM. RW2 determines which nybble of the data is presented to Port 1. With RW2 low, the low nybble of the data is read into the computer. Taking RW2 high disables IC7 and enables IC8 allowing the high nybble to be input to the computer. This completes one cycle of the Read.

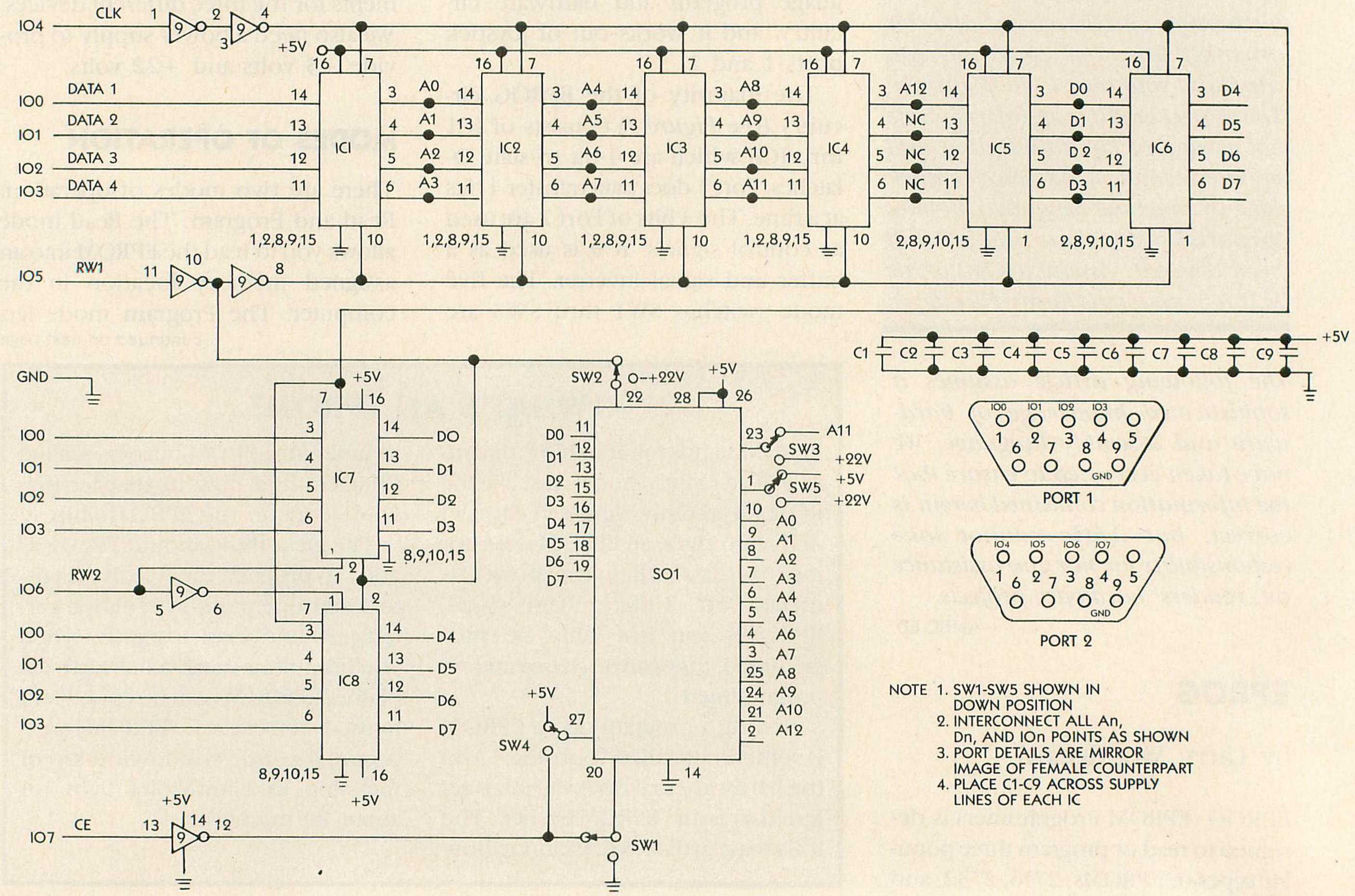
In Program mode the actions are simpler. The program sets the ports to output mode. The switches are set according to which EPROM you're programming—to apply the necessary programming voltage and chip enable (Ce) to the proper pins.

IC7 and IC8 are not used. IC5 and IC6 hold the low and high nybble of the data to be written to the EPROM in the same fashion as the address registers were used. The high data nybble is shifted in first, followed by the low data nybble, then the high nybble address and so on. Six shifts put the address and data in IC1 thru IC6. The programming pulse is then applied to Ce input. The data in IC5 and IC6 is burned into the address in IC1 through IC4.

The programming pulse is 50ms long for the 2716 and 2732. This makes the total programming time several minutes. The 2764 uses 1ms programming pulses and is accomplished in about 30 seconds. A Read can be performed after the EPROM is programmed to verify the data is correct.

Should you decide to rewrite the program, do not put the 4 bits of Port 1 in the output mode and make RW1 high under any circumstance, because this will be trying to input and output to Port 1 at the same time.

continued on page 72



Atari Power

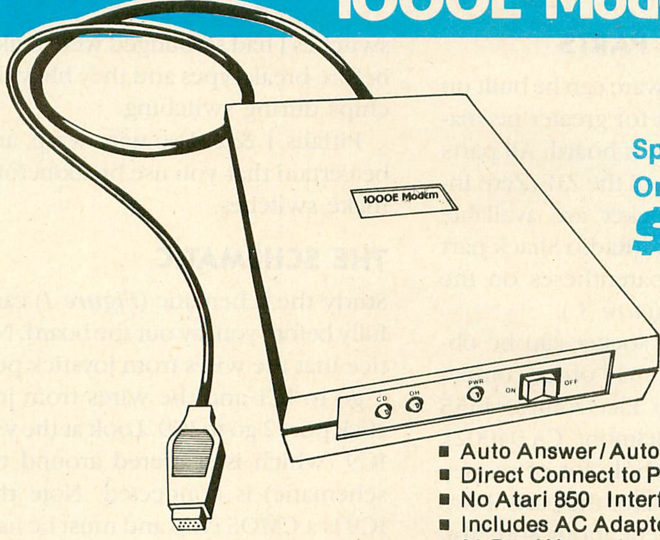


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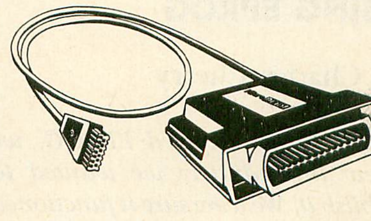
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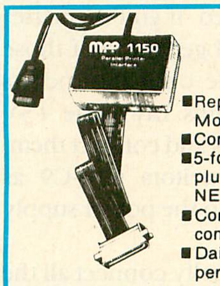
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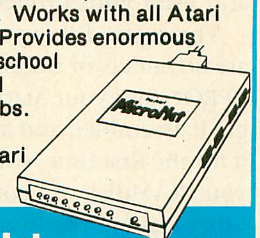
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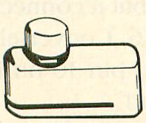
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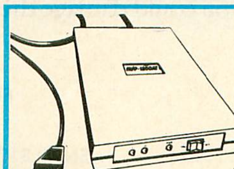
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ASSEMBLY LANGUAGE
continued from page 70

BUILDING AND USING EPROG

by Charles Cherry

*When **Antic** received EPROG, we knew immediately we wanted to publish it. We were sure it functioned properly for its designer, Larry Woodgeard, but we wanted to make sure our readers could build and operate it. We asked Charles Cherry, whom we knew to have the technical background for this kind of project, to build the EPROG from scratch and describe his experience—and the pitfalls.*—ANTIC ED.

The first thing you should notice about this project is that it plugs into the wall. This means dangerous voltages are present so it should be built and used with proper caution.

The second thing to note is there are no buffers or isolators between the EPROG and your Atari. So when you get it assembled and are ready to test it for the first time, you might unplug your RAMdisk, 80-column card and other custom hardware. Chances are everything will work fine, but if you make a mistake you could damage the computer.

GETTING THE PARTS

The EPROG hardware can be built on a breadboard, but for greater permanence, I chose a perf board. All parts except the chips and the ZIF (Zero Insertion Force) socket are available from Radio Shack. (Radio Shack part numbers are in parentheses on the Parts List—See *Figure 3.*).

The chips and socket can be obtained from most mail order companies (e.g. Jameco Electronics, 1355 Shoreway Road, Belmont, CA 94002). You can save a whole lot of money if you shop around for the parts. I was in a hurry so I spent about $60. You should be able to cut that in half.

This was the first IC project I ever built without a printed circuit board. I hope you can learn from my mistakes. Since I had no wire-wrap experience or tools, I decided on point-to-point soldering using some 22-gauge wire I had in my kit. A big mistake. It can be done, but it ain't easy. When I got finished, the thing did not work.

So I rebuilt it using wire wrap. It still did not work, but it was easier to check the wiring.

After hours of brain numbing trouble-shooting, designer Larry Woodgeard, discovered that the slide switches I had scrounged were make-before-break types and they blew the chips during switching.

Pitfalls 1 & 2: Use wire wrap, and be certain that you use break-before-make switches.

THE SCHEMATIC

Study the schematic (*Figure 1*) carefully before you lay out the board. Notice that the wires from joystick port 1 go to IC1 and the wires from joystick port 2 go to IC9. Look at the way IC9 (which is scattered around the schematic) is connected. Note that IC9 is a CMOS chip and must be handled with appropriate safeguards against static discharges.

Install the sockets and switches, but do *not* install the chips until the circuit has been tested. If you're smarter than I was, you'll get some of those labels which slide onto the sockets and identify the pins. Lay in the +5V and ground busses and connect them. Then install capacitors C1—C9 as close as possible to the power supply pins on the ICs.

Now, methodically connect all the pins, starting with IC1—be sure to check and recheck each hookup. Notice that pin 8 on IC9 connects to pin 10 on IC1—IC4, but it connects to pin 1 on IC5 and IC6. Conversely, pin 1 on IC1—IC4 and pin 10 on IC5 and IC6 go to ground.

Be very patient and don't try to do it all in one sitting. Use a low wattage iron (25 W or so), the smallest tip you can find, and your best technique. If you have trouble translating the diagram into real circuits, find someone who can read schematics to help you. It can be very difficult to troubleshoot an IC circuit, so take the time to get it right the first time.

WHERE THERE'S SMOKE...

When you have wired the EPROG, install the power supply (see *Figure 2*). Any supply which delivers +5VDC

continued on page 74

Figure 3

PARTS LIST

IC1-IC8	SN74LS173
IC9	MM74C14N
SW1-SW5	SPDT SWITCHES (275-625)
C1-C9	0.1MF CAPACITORS (272-1069)
MISCELLANEOUS	
8ea	16 PIN WIRE-WRAP SOCKETS (276-1998)
1ea	14 PIN WIRE-WRAP SOCKETS (276-1993)
1ea	IC BREADBOARD (276-1394)
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etc	

POWER SUPPLY PARTS LIST

T1	24VAC CT 450MA XFORMER (273-1366)
IC10	317T IC REGULATOR (276-1778)
IC11	7805 IC REGULATOR (276-1770)
C2	1500MF 16V CAPACITOR (use two 272-958)
C1,C3	220MF 35V CAPACITOR (272-1029)
D1-D4	1N4001 DIODE (276-1101)
S1	SPST 250VAC SWITCH (275-602)
F1	1AGX FUSE (270-1271)
R2	240 OHM 1/4W RESISTOR (271-1313)
R1	3.6K OHM 1/4W RESISTOR (271-1328)
R3	1K OHM POT (271-218)
MISCELLANEOUS	
2ea	HEATSINKS (276-1366)
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ASSEMBLY LANGUAGE
continued from page 72

@ 300 ma. and +22VDC @ 100 ma. will do. The diagrammed one is simple and works. You will need a voltmeter to adjust the output by tweaking R3.

When you get the proper voltages, connect the power supply to the EPROG circuitry. Then power up and let it run for a while. Flip all the switches to see if anything heats up or smokes.

Everything okay? Turn off the power and double-check your wiring one more time. Now, flip all the switches down and install the chips. Again be careful with IC9—it's a CMOS, so be sure and ground yourself to avoid stray static. Put in an EPROM, turn the power on—without plugging into your computer—and check for hot ICs or smoke. Flip all the switches again. If it still seems okay, plug in the Atari and run the program. Good luck!

BURNING THE CHIP

The EPROG software is designed to program the EPROM from code in a fixed buffer and to read the EPROM back into the same buffer. Buffer location depends on the type of EPROM used. The buffer for the 2716 is $8800 to $8FFF, the 2732 buffer is $8000 to $8FFF, and the 2764 buffer is $7000 to $8FFF.

EPROG must be used with a debugger or monitor, so after you've typed in, assembled, and created your object file, use your debugger to load EPROG and type "Go $6000".

The program will prompt you for chip number, read or write, and switch configuration. Following the screen prompts, read the EPROM, then return to the debugger and display the EPROM buffer area. If the EPROM is unprogrammed (or erased) the buffer will be all FFs. If the EPROM has not been erased, it cannot be programmed. Either replace it, or erase it with ultra-violet light, as mentioned previously.

Load or relocate the code you want to burn onto the EPROM. When the code is in the proper buffer call EPROG again with "Go $6000" and program the chip.

My debugger is BUG/65, from Optimized Systems Software, and I had to make one modification. The EPROG program cycle ends with a BRK instruction. Most debuggers regain control at this point, but not BUG/65. Instead I changed the final instruction to RTS and used "U 6000" (user) to call EPROG.

MAKING CARTRIDGES

When venturing forth into new territories it is always wise to get an expert guide. So I went over to American TV (15338 Inverness Street, San Leandro, CA 94577) for advice about making cartridges. The Atari 16K cartridge uses ROM chips which are compatible with the 2764. All you have to do is plug your EPROMs into the sockets.

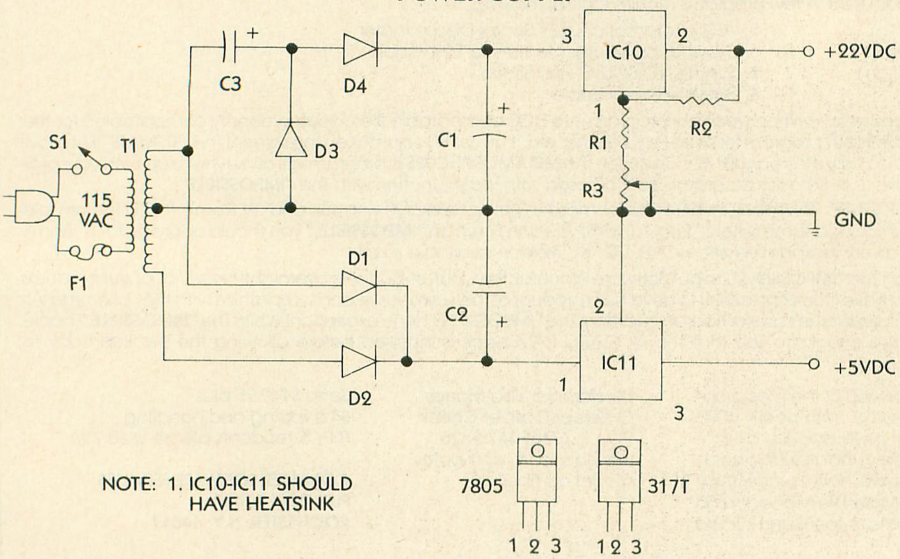
However the 8K Atari cartridges were designed for 2532 compatible ROMs, which EPROG cannot program. Luckily, there are modification boards for these cartridges which allow you to use 2732s. American TV has all of these cartridges, boards, kits and instructions available.

If you want to delve into the mysteries of operating system modification, the people to contact are Newell Industries (3340 Nothingham Lane, Plano, TX 75074). They make the RAMrod board which will take 2732 EPROMs on the Atari 800 and 400. However the XL/XE RAMrod board uses 27128s. If you have an XL/XE you will have to fabricate your own EPROM board.

This is an exciting and challenging project. If you are experienced with digital circuits or can find someone to assist you, give it a try.

Listing on page 89

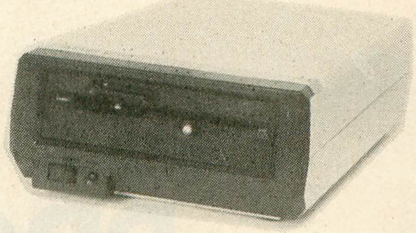
Figure 2
POWER SUPPLY



NOTE: 1. IC10-IC11 SHOULD HAVE HEATSINK



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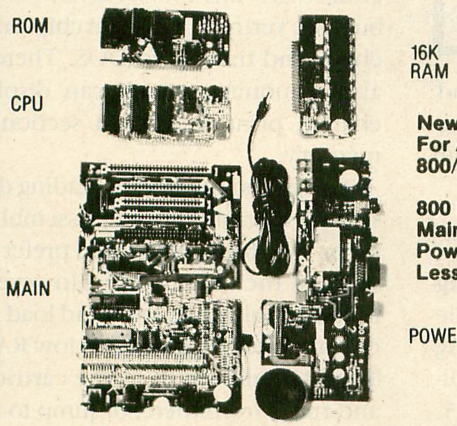
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De Re ATARI (All About ATARI) $15, tells you everything you want to know about the ATARI 400 and ATARI 800 Home Computers, but were afraid to ask. It's an excellent resource and training text for professional programmers who use ATARI Home Computers and for advanced hobbyists who understand ATARI BASIC and assembly language. Neither an introductory manual nor a reference for the computer, De Re ATARI explains the concepts behind the internal structure of the ATARI Home Computer.

Topics include graphics indirection, player-missile graphics, display list interrupts, scrolling, sound, the Operating System, the Disk Operating System, ATARI BASIC and CTIA. Extensive appendices, sample programs, display screens, and diagrams generously illustrate the discussions. A glossary defines and explains some less commonly encountered terms.

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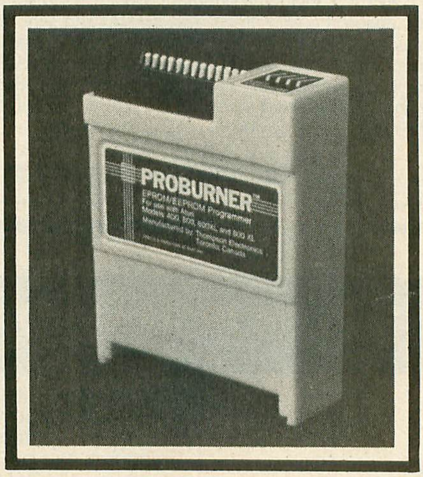
Reviewed by IAN CHADWICK

Why burn your own chips? For one thing, cartridge software loads and runs faster and easier. It also enables you to customize your operating system to suit your special needs.

However, burning chips—EPROMS or EEPROMS—is not something that most amateur programmers tackle. It's generally expensive, difficult and unforgiving. Also, the variety of EPROMS that can be programmed by most devices available is less than encouraging—too many are simply left out for one reason or another.

The Thompson Electronics **Proburner** now changes all that. It is an excellent buy for the versatility and ease of use that it offers. This EPROM burner fits into the cartridge slot of an Atari XL or XE computer. Control software is built in and so is the chip socket itself (a low insertion-force socket rated for 10,000 insertions). There's no need to hook up an 850 or load disk files first. But XE owners will quickly come to hate their cartridge slots on the back of the computer, since it makes chip insertion awkward and somewhat chancy.

The Proburner can read and write a wide range of 26-pin and 28-pin chips from 2K to 16K, including the 2716, 2732, 2764 and 27128 EPROMs as well as the 2816A, 52B13, 52B23 and 52B33 EEPROMs. It can also read



2K to 8K ROMs into memory and store the cartridge itself, using the burner as its own tester to see if your efforts worked.

EPROM BASICS

EPROMs can be erased with a strong ultraviolet light. Many electronic magazines have run stories explaining how to build an eraser using a medical UV sterilizing lamp for under $25. EEPROMs can be erased electrically. It's obviously easier, but EEPROM chips cost at least twice as much as EPROMs.

EPROMS are not necessarily pin-compatible with your computer or with the chips in your cartridges. (The OS ROM chip in the Atari XL/XE series is a compatible 27128.) You can read these chips with the Proburner, but you need a socket designed for an EPROM when you burn your code back into such a chip. Many third-party cartridges use EPROMs—Monkey Wrench and MAC/65, for example. Cannibalizing your unused carts is one simple method of obtaining the sockets.

OPERATIONS

Proburner's selection of software commands is slim; load and save a file to disk (using DOS, which overwrites code in low memory), cassette, copy, burn-in, verify or run from chip, erase check and transfer to DOS. There is also a monitor which can display, change, print or move a section of memory.

There is no method of reading disk sectors, assembling or disassembling memory—features I would prefer instead of the cassette I/O. However, I found I could go to DOS and load my own monitor program into low RAM. Then I could return to the cartridge and run it from there, or jump to the cart from the monitor. This gives me the ability to disassemble code before I try to change it.

The Proburner code itself takes up $8000 to $8FFF and seems to be duplicated between $9000 and $9FFF. That's a 4K duplication and, unless there is some good reason for it, the space could be better used by a disassembling monitor or a miniassembler. Running the burner from either start

location seems to produce the same results. If the Proburner wasn't so completely sealed in epoxy, I would take out the software chips and reburn one of the duplicate areas with my own software instead.

FINER POINTS

Many factors must be considered before you try to burn a chip. I planned to copy the XL/XE OS chip into RAM, save it to disk, delete the useless self-test code, replace it with my monitor program, change the startup colors, reverse the [OPTION] key toggle to activate BASIC when held down, fix the printer timeout bug, tamper with the floating point routines—and then write the whole 16K back into a 27128 chip.

However, Proburner saves memory to a disk file via the DOS binary save command. And loading DOS writes DUP into memory—up to $3306. So I over-wrote my carefully moved and edited ROM code. Sigh. There is enough room to fit all of the OS code into free RAM above DUP and not over-write it. But it's a consideration you must prepare for in advance.

If you aren't used to burning your own chips, I suggest you start slowly. Try a 2K or 4K EPROM before tackling a larger project. It's easier to erase and reburn, although burn time itself is only a few minutes. Learning to burn your own chips isn't really difficult. But because so little written help can be found anywhere, you must figure out a lot of the finer points by trial and error.

The Proburner has several built-in safety routines, such as a timer to wait while the cart sets up its internal hardware necessary for burning. There's also an automatic erase check-and-verify when burning an EPROM.

The instructions on inserting and reading a chip are well enough explained to be easily understood by novices. But otherwise, the Proburner manual leaves much to be desired. It's terse, to say the least. And it's written for those who already understand EPROM burners, not the novice. Proburner designer Peter Thompson tells me that rewriting the manual for a less-experienced reader is currently his main priority. But for the experienced user, Proburner is much easier to understand and operate than all others I've seen for the home market.

Specify your computer model when you order a Proburner. The XE version required the addition of a smaller capacitor to reduce signal noise—it will run happily on the older models but the 800XL version is not compatible with the 130XE.

Proburner opens the door for Atari users to get into the mysteries and joys of chip burning without seriously damaging their pocketbooks or causing severe frustration. I recommend it highly.

Proburner is available from Thompson Electronics, 1074 Kensington Avenue, Suite 188, Buffalo, New York, New York 14215. Telephone (416) 960-1089. The cost is $149, 32K cartridge.

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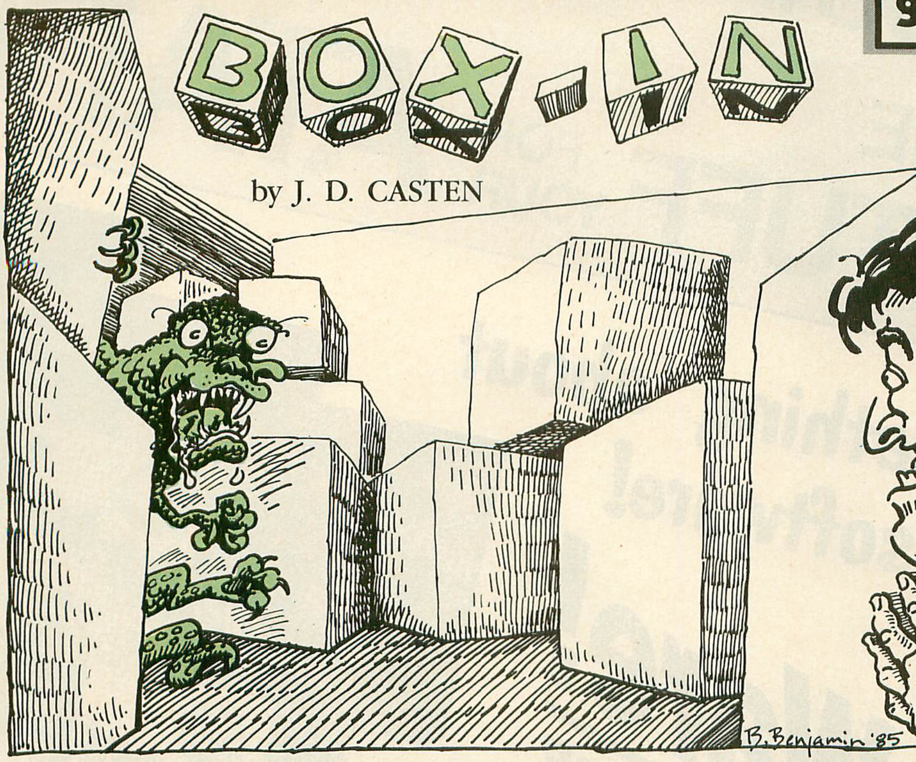
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by J. D. CASTEN

*You'll find an intriguing combination of arcade action and strategy challenge in this simple but highly involving game from the author of Biffdrop and other **Antic** hits. The BASIC program works on all Atari computers of any memory size, with disk or cassette.*

*We were making one of our regular bi-monthly phone calls to J.D. Casten in Eugene, Oregon, nagging him about when was he going to turn in another great Atari game. J.D. mentioned that he'd been going through his records and he wondered what became of his first game ever accepted by **Antic**—Box-In—late in 1983 when he was a high school freshman.*

*Box-In?? No current **Antic** Editor had been with the magazine back in '83. We swiftly ransacked our file cabinets and found only a cryptic notation that such a game had been accepted. There was absolutely no trace of the game itself and we urged Casten to send us another disk ASAP.*

*In due course, the package arrived. We read J.D.'s typically bizarre game scenario, booted Box-In, and within a few minutes we realized that **Antic** would be publishing a Casten game in our Christmas issue for the second consecutive year.*

*But wait, there was still more. The disk also included a slick new enhancement of Biffdrop (**Antic**, December 1984) with moving obstacles that would look right at home in **Blue Max 2001**. We took this game down the hall to the Antic Catalog, and now an APX Classics All-Casten Disk is in the works for the first quarter of '86.*

*This new collection will feature a never-before published game plus enhanced versions of **Antic**'s complete Casten game libarary—including Risky Rescue (April, 1984), Escape From Epsilon (June, 1984) and Advent X-5 (December, 1984). By the way, if you've been trying to type in J.D.'s golden oldies, you'll find TYPO II line codes in the July, 1985 issue.*

—ANTIC ED

Crazy Harold loves a thrill. So he puts himself into a room with a yucky green Harold-eating monster named Gruck.

Also in this room are 100 boxes. Not just any boxes, mind you. These are the large, solid, cube-shaped, yucky green Harold-eating monster-repellent type of box.

Harold attempts to trap Gruck with the boxes before Gruck turns him into monster mulch. Harold does this by pushing the boxes around Gruck until the monster cannot make a move (including diagonally). At the same time, Gruck—using more than his eyes, but less than his brain—ominously moves around searching for a quick Harold snack.

USING BOX-IN

Who will help Harold survive his thrill? Enter our hero, J. Q. Public. Type in Listing 1, check it with TYPO II and SAVE a copy before you RUN it.

[SELECT] a difficulty level. The higher the difficulty the slower you go and the faster Gruck goes. [START] the game and use the joystick to move Crazy Harold (remember diagonals).

Even if arcade games are the bane of your existence, I highly suggest you try this one out. I have found that many people who dislike arcade action games enjoy Box-In. Probably that's because even though Gruck may not be the fastest-moving monster around, you'll discover that you need to use plenty of strategy in order to protect Harold with the boxes.

Listing on page 93

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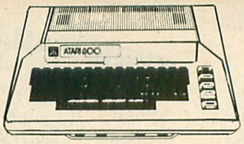
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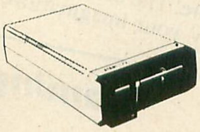
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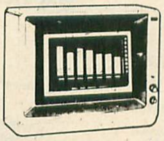
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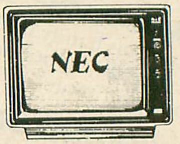
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Antic type-in listing section includes every full-length program from this issue. Listings are easier to type and proofread, easy to remove and save in a binder if you wish.

DISK SUBSCRIBERS: You can use all these programs immediately. Just follow the instructions in the accompanying magazine articles.

Antic program listings are typeset on the Star's SG-10 printer—from Star Micronics, Inc., 200 Park Avenue, New York, NY 10166.

TYPING SPECIAL ATARI CHARACTERS

Antic printed program listings leave a small space between each Atari Special Character for easier reading. Immediately below you will see the way **Antic** prints all the standard Atari letters and numbers, in upper and lower case, in normal and inverse video.

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
0123456789 0123456789

The Atari Special Characters and the keys you must type in order to get them are shown in the two boxes below. (Squares are drawn around the normal video characters so you can see their positions more accurately, these squares will not appear in listings.)

NORMAL VIDEO

FOR THIS	TYPE THIS	FOR THIS	TYPE THIS
	CTRL ,		CTRL T
	CTRL A		CTRL U
	CTRL B		CTRL V
	CTRL C		CTRL W
	CTRL D		CTRL X
	CTRL E		CTRL Y
	CTRL F		CTRL Z
	CTRL G		ESC ESC
	CTRL H		ESC CTRL –
	CTRL I		ESC CTRL =
	CTRL J		ESC CTRL +
	CTRL K		ESC CTRL *
	CTRL L		CTRL .
	CTRL M		CTRL ;
	CTRL N	|	SHIFT =
	CTRL O		ESC SHIFT CLEAR
	CTRL P		ESC DELETE
	CTRL Q		ESC TAB
	CTRL R		
	CTRL S		

INVERSE VIDEO

FOR THIS	TYPE THIS	FOR THIS	TYPE THIS
	人CTRL ,		人CTRL Y
	人CTRL A		人CTRL Z
	人CTRL B		ESC SHIFT DELETE
	人CTRL C		ESC SHIFT INSERT
	人CTRL D		ESC CTRL TAB
	人CTRL E		ESC SHIFT TAB
	人CTRL F		人CTRL .
	人CTRL G		人CTRL ;
	人CTRL H		人SHIFT =
	人CTRL I		ESC CTRL 2
	人CTRL J		ESC CTRL DELETE
	人CTRL K		ESC CTRL INSERT
	人CTRL L		
	人CTRL M		
	人CTRL N		
	人CTRL O		
	人CTRL P		
	人CTRL Q		
	人CTRL R		
	人CTRL S		
	人CTRL T		
	人CTRL U		
	人CTRL V		
	人CTRL W		
	人CTRL X		

Whenever the CONTROL key (CTRL on the 400/800) or SHIFT key is used, *hold it down* while you press the next key. Whenever the ESC key is pressed, *release* it before you type the next key.

Turn on inverse video by pressing the Reverse Video Mode Key. Turn it off by pressing it a second time. (On the 400/800, use the Atari Logo Key 人 instead.) Note: In the printed listings, inverse characters will be slightly smaller than the normal ones.

Among the most common program typing mistakes are switching certain capital letters with their lower-case counterparts—you need to look especially carefully at P, X, O and 0 (zero).

Some of Atari Special Characters are not easy to tell apart from standard alpha-numeric characters. Usually the Special Characters will be *thicker* than the alpha-numerics. Compare the two sets of characters below:

SPECIAL		STANDARD	
	CTRL F		/
	CTRL G		SHIFT +
	CTRL N		SHIFT -
	CTRL R		-
	CTRL S		+

HOW TO USE TYPO II

TYPO II is the improved automatic proofreading program for **Antic's** type-in BASIC listings. It finds the exact line where you made a program typing mistake.

Type in TYPO II and SAVE a copy to disk or cassette. Now type GOTO 32000. When you see the instruction on the screen, type in a single program line **without the two-letter TYPO II code** at left of the line number. Press [RETURN].

Your line will reappear at the bottom of the screen with a two-letter TYPO II code on the left. If this code is not exactly the same as the line code printed in the magazine, you mistyped something in that line.

To call back any line previously typed, type an asterisk [*] followed (without in-between spaces) by the line number, then press [RETURN]. When the complete line appears at the top of the screen, press [RETURN] again. This is also the way you use TYPO II to proofread itself.

To LIST your program, press [BREAK] and type LIST. To return to TYPO II, type GOTO 32000.

To remove TYPO II from your program, type LIST "D:FILENAME",0,31999 [RETURN] (Cassette owners LIST "C:). Type NEW, then ENTER "D:FILENAME" [RETURN] (Cassette—ENTER "C:). Your program is now in memory without TYPO II and you can SAVE or LIST it to disk or cassette.

Owners of the BASIC XL cartridge from O.S.S. type SET 5,0 and SET 12,0 before using TYPO II.

Don't type the TYPO II Codes!

```
WB 32000 REM TYPO II BY ANDY BARTON
VM 32010 REM VER. 1.0 FOR ANTIC MAGAZINE
HS 32020 CLR :DIM LINE$(120):CLOSE #2:CLO
   SE #3
BN 32030 OPEN #2,4,0,"E":OPEN #3,5,0,"E"
YC 32040 ? "K":POSITION 11,1:? "TYPO II"
EM 32050 TRAP 32040:POSITION 2,3:? "Type
   in a program line"
HS 32060 POSITION 1,4:? " ":INPUT #2;LINE
   $:IF LINE$="" THEN POSITION 2,4:LIST B
   :GOTO 32060
XH 32070 IF LINE$(1,1)="*" THEN B=VAL(LIN
   E$(2,LEN(LINE$))):POSITION 2,4:LIST B:
   GOTO 32060
TH 32080 POSITION 2,10:? "CONT"
MF 32090 B=VAL(LINE$):POSITION 1,3:? " ";
NY 32100 POKE 842,13:STOP
CN 32110 POKE 842,12
```

Don't type the TYPO II Codes!

```
ET 32120 ? "K":POSITION 11,1:? " TYPO II
   ":POSITION 2,15:LIST B
CE 32130 C=0:ANS=C
QR 32140 POSITION 2,16:INPUT #3;LINE$:IF
   LINE$="" THEN ? "LINE ";B;" DELETED":G
   OTO 32050
VV 32150 FOR D=1 TO LEN(LINE$):C=C+1:ANS=
   ANS+(C*ASC(LINE$(D,D))):NEXT D
WJ 32160 CODE=INT(ANS/676)
JW 32170 CODE=ANS-(CODE*676)
EH 32180 HCODE=INT(CODE/26)
BH 32190 LCODE=CODE-(HCODE*26)+65
HB 32200 HCODE=HCODE+65
IE 32210 POSITION 0,16:? CHR$(HCODE);CHR$
   (LCODE)
VG 32220 POSITION 2,13:? "If CODE does no
   t match press RETURN and edit line a
   bove.":GOTO 32050
```

ERROR FILE

ATARI 'TOONS

August 1985

The 22nd character in line 1090 of listing 2 is an A. Also, to load non-standard character sets, change NUMBER=1024 in line 1140 to: NUMBER=2050, and change line 1150 to: 1150 GOTO 1170.

GUESS THAT SONG

July 1985

The September, 1985 HELP! section contains an easier-reading listing of some of the tougher data lines in Guess That Song.

STAR VENTURE

July 1985

Change line 380 to:

```
380 IF PEEK(53279
)=6 THEN SOUND 0,
0,0,0:GOTO 80
```

MUSICIAN

June 1985

Change line 790 to:

```
790 IF A=54 THEN
POSITION 4,22:? #
6;"song cleared":
GOTO 810
```

And if you're having tempo problems, remove line 1720 and add the following:

```
1715 IF A=14 THEN
 TEMPO=-0.25:GOTO
 1700
1720 REM REMOVE T
HIS LINE
```

MANEUVER

April 1985

If you get hearts on the title screen, LIST the program to disk or cassette, type NEW, then ENTER and SAVE it.

FONT MAKER FOR SG-10

March 1985

The July 1985 issue of ANTIC contains a listing which, when merged with FONT MAKER, makes that program work on the Star SG-10. See the HELP section of that issue for instructions.

CUSTOM PRINT

March 1985

Custom Print has problems printing certain characters using redefined characters. Change line 5 to:

```
5 CS=PEEK(106)-8:
POKE 106,CS-1:GRA
PHICS 0:DIM CST$(
20):CST$=""
```

Antic super-utility now even better

DISKIO PLUS

Article on page 26

LISTING 1

Don't type the TYPO II Codes!

```
RS 10 REM DISKIO PLUS, LISTING 1
OK 15 REM BY PATRICK DELL'ERA
OZ 20 REM (BASIC LOADER BY C. JACKSON)
FW 30 REM (c) 1985, ANTIC PUBLISHING
MF 40 DIM FN$(20),TEMP$(20),AR$(93)
YQ 50 ? "↖DISKIO PLUS FILE CREATOR"
JQ 55 TLOC=PEEK(10592):POKE 10592,255
YM 60 ? :? "Output filename";:INPUT FN$
UK 70 IF FN$(1,1)="D" AND (FN$(2,2)=":" O
   R FN$(3,3)=":") THEN 90
MH 80 TEMP$(1,2)="D:":TEMP$(3)=FN$:FN$=TE
   MP$
WD 90 ? :? "Configure for BASIC or Assemb
   ler";:INPUT TEMP$
ON 92 IF TEMP$="B" THEN CNF=0:GOTO 99
PD 94 IF TEMP$="A" THEN CNF=1:GOTO 99
YE 96 ? "↑↑";:GOTO 90
LP 99 TRAP 160:POKE 10592,TLOC
PX 100 ? :? :? "Working...please stand by
   "
LO 110 RESTORE :READ LN:LM=LN:DIM A$(LN):
   C=1
BI 120 AR$="":READ AR$
XU 130 FOR X=1 TO LEN(AR$) STEP 3:POKE 75
   2,255
DE 140 LM=LM-1:POSITION 10,10:? "(Countdo
   wn...T-";INT(LM/10);")     "
SU 150 A$(C,C)=CHR$(VAL(AR$(X,X+2))):C=C+
   1:NEXT X:GOTO 120
FI 160 IF CNF=1 THEN A$(1929,1929)="*":A$
   (1942,1942)=" ":A$(3270,3274)="65535"
TT 170 IF PEEK(195)=5 THEN ? :? "↰TOO MAN
   Y DATA LINES!!!":? "CANNOT CREATE FILE
   !":END
YX 200 IF C<LN+1 THEN ? :? "↰TOO FEW DATA
    LINES!!!":? "CANNOT CREATE FILE!":END
OH 210 CLOSE #1:OPEN #1,8,0,FN$:POKE 766,
   1:? #1;A$;:CLOSE #1:POKE 766,0
RU 220 GRAPHICS 0:? " COMPLETED "
JW 1000 DATA 3660
VN 1010 DATA 255255000048182048112112112112
   1211211211207102504811211211200611211 2
   11200211200211200206500004 8
LM 1020 DATA 000000100105115107105111000 2
   40236245243000000000000340570000480140 44
   01400003603704404400703705 0
GE 1030 DATA 033000000000000809900090000330
   460520410350000450330390330580410460 37
   01200001701801502402100000 0
EU 1040 DATA 000000000000000000000000000000
   000000000000340971151011000001111100 00
   00000000000000000000000000
XR 1050 DATA 000000000036041051043041047 0
   000981210000361140140000341011141100 97
   11410000004711211210111010 4
HO 1060 DATA 101105109000169033141047002 1
   690001410480021690481410490021690041 41
   19800214120000217319700214 1
EA 1070 DATA 199002096224002227002076042 1
   530481090292390421721700291692551530 26
   00316925515302700317314302 9
UK 1080 DATA 133010173144029133011173146 0
   291330121731470291330130762552550322 55
   25504409604104802916914513 3
CM 1090 DATA 012169029133013169109133010 1
   690291330111602551690931530260032001 69
   02915302600309603223303016 2
RJ 1100 DATA 032032235030160000185097041 0
   321900302002011552082450321540301602 55
   10420015321800019202320824 7
LA 1110 DATA 104170104168169155040096032 2
   552550082011552082461520721380721600 23
   18521800007213601624917307 2
CH 1120 DATA 003056229040240208141095041 1
   692291332231690411332241622551342202 32
   13423316025523022020020409 5
LW 1130 DATA 041240002176016177223048026 2
   401721851280050321770302092232402322 00
   17722301625120020020015203 2
GR 1140 DATA 142030208214185128005032177 0
   300731282092232082352000440960410160 23
   16903519722324001707620702 9
WR 1150 DATA 041127201048144006201058176 0
   020560960240961740950411691551571280 05
   18912800503217703015712800 5
UW 1160 DATA 202016244169000133234133239 1
   690290721691820721772230722001322221 77
   22307209602410122313322316 9
IB 1170 DATA 000101224133224096169255141 2
   520021690051410660031330341691281410 68
   00316900514106900309620115 5
LO 1180 DATA 240008041127201065144002041 0
   950961531280052300361980402060720030 96
   16900013323518512800503208 6
EQ 1190 DATA 030144007141089041200185128 0
   052010472080082001851280050091281332 35
   09616201616901215706600307 6
MO 1200 DATA 086228169128160005162000157 0
   680031521570690031691281570720031690 00
   15707300316900915706600307 6
DK 1210 DATA 192040141028031140029031160 2
   552001851280051531880050162470731281 53
   18800520016903215318800520 0
TX 1220 DATA 140077031169188160005076066 0
   311691551620000721690002400121620000 72
   15706800315215706900316912 8
AV 1230 DATA 157072003169000157073003169 0
   111570660031040761920401332371322380 32
   06603116523716423816201603 6
LL 1240 DATA 239048004036235048208096142 0
   770311332231322241720770311361772231 53
   22600513601624816922616000 5
II 1250 DATA 076066031162008169111160041 0
   721520721380721620160322350301741550 31
   10415707400310415706900310 4
YP 1260 DATA 157068003169003157066003076 1
   920401620581691682361700052400021691 65
   16000509616000303220103003 2
OJ 1270 DATA 144033016013169165160002032 2
   350350321820310762230311690881600411 62
   00603214903101600109616912 5
ZZ 1280 DATA 032059031169000133219133223 0
   241650141332271050181332311650151332 28
   10500013323216201616901902 4
QJ 1290 DATA 101227133227157068003169000 1
   012281332281570690031652270562330011 33
   22916522823300013323016900 5
TP 1300 DATA 157066003169018157072003032 1
   920401890720032010172400541600001772 27
   20014522723021916904019721 9
YV 1310 DATA 240039165223248024105001216 1
   332230720412400740740740740090482010 48
   20800216903216000014522920 0
```

```
JN 1320 DATA 104041015009048145229076003032036235016007036239048003032143031165229072165230072162000134233
JV 1330 DATA 232165231024105001133229165232105000133230165219201002176007201001240065076098033024165229133
QH 1340 DATA 227105019133229165230133228105000133230160002177229209227144009208026200192013176021144241169
SV 1350 DATA 001133233160016177229072177227145229104145227136208243232228219208198165233208163165231133227
YA 1360 DATA 133229165232133228133230165219072074105000133223170104056229223133224165229024105019133229169
ZX 1370 DATA 000101230133230202208240169001133085133082169018141077031036223048075198223048071165227164228
KV 1380 DATA 032095031169019141077031024101227133227169000101228133228036224048221198224048217169002141077
CW 1390 DATA 031169019160041032095031169019141077031165229164230032095031165229024105019133229169000101230
KP 1400 DATA 133230076014033169002133085133082169018141077031104133224104133223160000169155145223165219106
NS 1410 DATA 176008169001032142030206077031165223164224032095031076183037160255162001232189128005201032240
AM 1420 DATA 012201044240008236095041208239169000096200232189128005192001208012201058208008072169049153168
CV 1430 DATA 005200104153168005236095041208227169155153168005096032144033048001096169032016032169033016026
ZL 1440 DATA 169035016024169036016020160006032201030169033141090003169254036235016002169253198233133218032
TK 1450 DATA 233030036239048025165220010168185203041072185204041168104198084032018031036218016003076007035
HG 1460 DATA 173095041201003176001096173130005032086030176067201058240060201068208019173131005201058240036
NL 1470 DATA 032086030144007173132005201058240024162020189130005157131005202016247160002032233035200185130
LH 1480 DATA 005048013016248160255200185130005153128005016247132238076018035041031201016208002169000133236
DM 1490 DATA 173131005041031133237201016048011201026016007173095041201003208008165236133237169128133236056
MU 1500 DATA 165088233019133223165089233000133224169020032142030160001177223240104197237208241136165236041
LE 1510 DATA 127209223208232200200177223240004201010208222169128133227169005133228160003177223240039024105
DK 1520 DATA 032145227200192011240021192014208238136169046209227240001200169155145227132238076007035169046
LP 1530 DATA 145227230227208213192011176227169046145227200192011240200198227208247160002036218016002160006
QW 1540 DATA 032233035165218201010240042010322081201600001731280051411650052001851280052010582080031690049
SG 1550 DATA 136141166005200185128005141167005165218201010240028198234162004169165160005032149031008032233
KY 1560 DATA 030040048010162023169021160041032117031096160002200185128005201155240008201032240004201044208
IF 1570 DATA 240169032153128005162003165218201032240014169058205169005240007205170005240002162000200189165
RB 1580 DATA 005232153128005201155208244165218201032176001096032243030036233016003032196035162016165218157
PZ 1590 DATA 066003169000157073003169040157072003169128157068003169005157069003032192040096162017169111160
ZU 1600 DATA 041032117031169255141252002052520022402511732520020410630720320570311042010432080010961041 04
IU 1610 DATA 096169128133227169005133228185088041145227136016248096174095041224003176001096162000160255232
PK 1620 DATA 189128005048011201044208246072169155157128005104200153208005201155240007232189128005076023036
HF 1630 DATA 169001032245033169034032059031160000200185128005016250169034153128005162255232200189208005153
QH 1640 DATA 128005016246032243030032196035165220010168185203041133227185204041133228162030160036189128005
QR 1650 DATA 153128005136202016246162005160000177227041127032190030200202016245136173044036032190030200185
BW 1660 DATA 128005016247140095041076147039169000133235160002200185128005201047208047185129005141168005009
ZR 1670 DATA 128133235032086030144007169155153128005048044169058141169005169155141170005153128005185130005
VS 1680 DATA 048054041001141254002016047201032240004201044208006032144033076249036204095041208182169000032
SY 1690 DATA 245033160255200185128005153168005016247165235016005041127141169005032057031169010032245033036
FW 1700 DATA 239048006032243030032196035160255200185128005048011201042240004201063208242076188037165235041
CL 1710 DATA 127133226208022174170005173169005224005129005208004009128133226169016133225
HP 1720 DATA 036226016005032016038208089169032141155031169128160005162004032149031032036038036226016005032
VV 1730 DATA 028038208063165235016020201208206008006032143031076143037201211208006169000133225240023032182031
LK 1740 DATA 162008032149031076143037032036038036226016005032028038208016032068038036233048009036226016233
KD 1750 DATA 032016038240228032233030162032235030169000141254002165233016007201136240003076219040036239
WB 1760 DATA 048018096169255133239169048133240133241169128160005076223031230241165241201058208004230240169
LG 1770 DATA 048133241141131005198219016001096165240141130005169046141128005169077141129005162047160155165
RA 1780 DATA 235016013142132005041127141133005016003140134005032145036076201690441600 41
XC 1790 DATA 032117031076196035162019169058160041208242056173229002229014162032157072003173230002229015157
CI 1800 DATA 073003165014157068003165015157069003204703913223309616622517310000315706800317310100315706900 3173104
BG 1810 DATA 003157072003173105003157073003169011157066003076192040172095041136136185128005201047208005169
FA 1820 DATA 155153128005133235133229169001032245033032243030169128160005162004032149031169059141224002141
TI 1830 DATA 226002169039141225002141227002032028039016015201136208008036235048003020250390960762190401 69
IL 1840 DATA 255205128005208010205129005208005133229076156038036229016231173128005133224032
KO 1850 DATA 028039162016173128005056229 2
```

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```
   23157072003173129005229224157073003189
   0720030241050011570720O3189
XV 1860 DATA 0730031050001570730031652231
   5706800316522403204703904815903623504 8
   01303202220391690591412260O2
VI 1870 DATA 1690391412270020761560381082
   2600210822400216201616900215707200316 9
   000157073003169128157068003
RV 1880 DATA 1690051570690031690071570660
   0303208622815209616925504800216900014 1
   096041096160000403220103017 3
DM 1890 DATA 0890411411570411620171691501
   6004103211703103219603516200816915616 0
   041032149031032233030096169
LI 1900 DATA 0002400061690312080021690622
   0609504120805919808413322316002913222 4
   032247030160255200177223032
KU 1910 DATA 1900302011552082461400950411
   0410403215403007600203017209504113618 5
   128005201044208014162000200
WB 1920 DATA 1891050410321900302322240062
   0824410410407620702916912503205903116 9
   255133227169229141028031169
RE 1930 DATA 0411410290312302270320240312
   3807703117307703102410902803114102803 1
   173029031105000141029031165
PQ 1940 DATA 2272400442010121760460101681
   7302803107217302903107218520304114102 8
   031185204041141029031169061
ON 1950 DATA 0320590312300850320240311041
   4102903110414102803103205703107620403 9
   201016144246032057031162255
XH 1960 DATA 2321890610421571280050162470
   4112715712800523216904815712800523216 9
   032157128005162006157128005
QK 1970 DATA 1730660421602550320950401730
   6904216003003209504017307204216006103 2
   095040198084096238131005162
UW 1980 DATA 0050731281571280052322322001
   8500002915712800520115520824407624303 0
   160037204095041144091200173
TH 1990 DATA 1310050410151702020480812240
   0317607716915517209504115312800516922 5
   133223169028133224160253200
VU 2000 DATA 2002001690310321420302020162
   4517313300507312815306604216025520018 5
   135005145223201155208246096
OY 2010 DATA 0320862280362340480031520480
   1116900013323416901614115503115209619 2
   128240241104104169002133085
SL 2020 DATA 1330821921282400451521620481
   6004820101014401023301020019205814424 5
   232208240009048141086041140
DD 2030 DATA 0850412240482080021620321420
   8404116201116907716004103211703109603 2
   032156068117112108105099097
XG 2040 DATA 1161010321021051081011100971
   0910104604604615506008311111711409910 1
   032068105115107062155060068
AH 2050 DATA 1011151161051100971161051111
   1003206810511510706215506911411411111 4
   032035048048048155068049058
SG 2060 DATA 0420460421550000000760730830
   8404904404815505105005505405515508011 4
   101115115002217022105102032
OD 2070 DATA 1111070971210320620820690780
   6507719706806907606908419707607906720 3
   085078076079067203087082073
OD 2080 DATA 0840690320680490580680790830
   4608308908315507607308308416008306508 6
   069160069078084069210066073
YM 2090 DATA 0780650820890320760790650681
   6008208507803216007707908619722904112 8
   041134041140041144041167041
BJ 2100 DATA 1720411770411890411940411820
   4119904115004107007908207706521203322 4
   046206033202046196033212046
KG 2110 DATA 2030332160462130332200462160
   3524904621103524904619703524904620403 5
   249046210035249046194038101
CH 2120 DATA 0462050361400680732100311950
   7907019803905907920603906307607308321 2
   039154087068079211039069076
HK 2130 DATA 1740391540720690762080391840
   6806919804012015503910515503910915503 9
   113000165012141146029165013
UJ 2140 DATA 1411470291650101411430291650
   1114114402916025320020020018502600320 1
   069208246200140170029185026
XB 2150 DATA 0031332231411130291690931530
   2600320018502600313322414111802916902 9
   153026003160015177223153093
OP 2160 DATA 0291360162481730970290241050
   0114122702917309802910500014122802916 9
   225141097029169029141098029
QE 2170 DATA 1690761412310021690421412320
   0216501214114602916501314114702916915 5
   141000029141031029141062029
RW 2180 DATA 1690001330201691282381990021
   9702017624916200014215503103223503016 9
   105160042162012032149031076
WE 2190 DATA 148029
```

LISTING 2

```
CN 10 REM DISKIO PLUS MACRO SAVER
QB 20 REM BY PATRICK DELL'ERA
FW 30 REM (c) 1985, ANTIC PUBLISHING
ZG 50 DIM KEYBFFR$(31*3),TEMP$(31),KEY(2)
   ,FILE$(20)
SZ 60 KEYBFFR$=CHR$(155):KEYBFFR$(31*3)=K
   EYBFFR$:KEYBFFR$(2)=KEYBFFR$
II 70 CLOSE #1:OPEN #1,4,0,"E:"
UP 80 POKE 710,4:POKE 712,4
TK 90 GOSUB 490
LW 100 FOR X=1 TO 31*3
TC 110 KEYBFFR$(X,X)=CHR$(PEEK(7423+X))
LP 120 NEXT X
CK 130 ?
QT 140 FOR X=0 TO 2
JS 150 KEY(X)=PEEK(10818+X*3)
BU 160 ? "DEF";X+1;" ";CHR$(KEY(X)-128);"
    ";
JA 170 Y=1+X*31
AQ 180 ? #1;KEYBFFR$(Y,Y);
SQ 190 IF ASC(KEYBFFR$(Y,Y))<>155 THEN Y=
   Y+1:GOTO 180
LM 200 NEXT X
CH 210 ?
LO 220 ? "Enter filename for saving:":? "
   >";
GQ 230 X=PEEK(10592):POKE 10592,255
YC 240 INPUT #1;TEMP$
PE 250 POKE 10592,X
OU 260 FILE$="D1:":IF TEMP$(2,2)=":" OR T
   EMP$(3,3)=":" THEN FILE$=TEMP$:GOTO 28
   0
HO 270 FILE$(4)=TEMP$
IX 280 X=1
GY 290 IF X>LEN(FILE$) THEN 320
DY 300 IF FILE$(X,X)="." THEN 320
YP 310 IF X<12 THEN X=X+1:GOTO 290
JJ 320 FILE$(X)=".KEY"
EK 330 CLOSE #1:OPEN #1,8,0,FILE$
DG 340 PUT #1,255:PUT #1,255
LY 350 PUT #1,0:PUT #1,29
LG 360 PUT #1,92:PUT #1,29
CK 370 FOR X=1 TO LEN(KEYBFFR$)
JZ 380 PUT #1,ASC(KEYBFFR$(X,X))
MF 390 NEXT X
UZ 400 A=63
QQ 410 FOR X=0 TO 2
NH 420 A=A+3
PJ 430 PUT #1,A:PUT #1,42
PL 440 PUT #1,A:PUT #1,42
QR 450 PUT #1,KEY(X)
MA 460 NEXT X
LO 470 CLOSE #1
```

```
OJ 480 END
YH 490 ? "K                  DISKIO PLUS "
NK 500 ? "        KEY MACRO SAVE UTILITY "
JP 510 ? "        by   Patrick Dell'Era↓↓↓"
HA 520 ? "Current Keyboard Macro Definiti
   ons:"
ZH 530 RETURN
```

LISTING 3

```
ZF 2 REM DISKIO PLUS, LISTING 3
DQ 4 REM BY PATRICK DELL'ERA
FG 6 REM (c) 1985, ANTIC PUBLISHING
LP 10 GRAPHICS 0
UB 20 POKE 752,1:POKE 712,4:POKE 710,4
VQ 30 ? :? :? ," DISKIO PATCH "
FW 40 ? ,"      by"
AK 50 ? ,"P.L. Dell'Era"
FV 60 ? :? :?
CH 70 ? "This patch makes DISKIO compatib
   le"
AZ 80 ? "with both DOS 2.0S and 2.5."
IW 90 ? "It is assumed that DISKIO is cal
   led"
FR 100 ? "AUTORUN.SYS in Disk Drive 1."
YU 110 ? :? "When you are ready, press ST
   ART..."
TB 120 IF PEEK(53279)<>6 THEN 120
UE 130 CLOSE #1:OPEN #1,12,0,"D:AUTORUN.S
   YS"
PH 140 FOR X=1 TO 4:GET #1,A:NEXT X
YP 150 ? #1;CHR$(140);CHR$(41);
CN 160 FOR X=1 TO 2541:GET #1,A:NEXT X
AR 170 FOR X=1 TO 35
SW 180 READ A
EC 190 ? #1;CHR$(A);
LM 200 NEXT X
IJ 210 FOR X=1 TO 537:GET #1,A:NEXT X
TN 220 FOR X=1 TO 6
SN 230 READ A
DT 240 ? #1;CHR$(A);
LW 250 NEXT X
PG 260 CLOSE #1:OPEN #1,9,0,"D:AUTORUN.SY
   S"
FT 270 FOR X=1 TO 88
SX 280 READ A
ED 290 ? #1;CHR$(A);
LN 300 NEXT X
LB 310 CLOSE #1
SU 320 ? :?
IZ 330 POKE 752,0
DB 340 ? "The Patch has been installed...
   "
OC 350 END
GU 360 DATA 68,73,83,75,73,79,32,52,46,51
PT 370 DATA 49,32,45,45,79,112,112,101,11
   0,104
PC 380 DATA 101,105,109,32,38,32,68,101,1
   08,108
UU 390 DATA 39,69,114,97,155
CM 400 DATA 162,12,236,171,25,240,46,162,
   15,169
HK 410 DATA 156,72,138,10,168,185,107,41,
   133,208
KJ 420 DATA 185,108,41,133,209,160,0,104,
   72,145
TD 430 DATA 208,202,240,10,224,6,208,230,
   104,169
BN 440 DATA 166,72,208,224,104,169,146,14
   1,79,38
WG 450 DATA 141,92,38,76,13,29,53,36,144,
   36
BH 460 DATA 1,37,190,37,89,38,106,38,56,3
   1
VQ 470 DATA 212,31,197,35,226,35,32,36,14
   7,36
OF 480 DATA 222,36,4,37,142,37,193,37,226
   ,2
UV 490 DATA 227,2,53,41
```

chip programming for $30

BUILD YOUR OWN EPROM BURNER

Article on page 69

LISTING 1

```
10 ;EPROG
20 ;BY LARRY A. WOODGEARD
30 ;(c) 1985, ANTIC PUBLISHING
40 ;DEFAULT 2764
50         *=   $6000
60 ADDRL =    $CE
70 ADDRH =    $CF
80 CLK   =    $10
90 RW1   =    $20
0100 RW2 =    $40
0110 EN  =    $80
0120 PORTA = $D300
0130 PACTL = $D302
0140 DSUM =   $CD
0150 ;EPROM=$6123 FOR 2764
0160 ;EPROM=$612B FOR 2732
0170 ;EPROM=$6133 FOR 2716
0180 EPROM = $6123
0190 GBUF =   $6360
0200 GBUFL = $60
0210 GBUFH = $63
0220 VADDRL = $CE
0230 VADDRH = $CF
0240 IOCB2 = $20
0250 ICCOM = $0342
0260 ICBAL = $0344
0270 ICBAH = $0345
0280 ICBLL = $0348
0290 ICBLH = $0349
0300 ICAX1 = $034A
0310 ICAX2 = $034B
0320 CIOV =   $E456
0330 ADTEXL = $CB
0340 ADTEXH = $CC
0350        JMP EPTYPE
0360 READR
0370 ;READ ROUTINE
0380        LDA #$00
```

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```
0390      STA ADDRL
0400      LDA #$70
0410      STA ADDRH
0420 READ LDX #$7F
0430      JSR PORTMODE
0440      JSR ADDROUT
0450      LDX #$70
0460      JSR PORTMODE
0470      LDA #RW1
0480      JSR CLKOUT
0490      LDA #$0F
0500      AND PORTA
0510      STA DSUM
0520      LDA #RW1+RW2
0530      JSR CLKOUT
0540      LDA #$0F
0550      AND PORTA
0560      CLC
0570      ASL A
0580      ASL A
0590      ASL A
0600      ASL A
0610      CLC
0620      ADC DSUM
0630      LDY #$00
0640      STA (ADDRL),Y
0650      INC ADDRL
0660      BNE READ
0670      INC ADDRH
0680      LDA ADDRH
0690      CMP #$90
0700      BNE READ
0710      LDX #$00
0720      JSR PORTMODE
0730      BRK
0740 ;ADDROUT SUBROUTINE
0750 ADDROUT
0760      LDA #$F0
0770      AND ADDRH
0780      JSR DIV16
0790      SEC
0800      SBC #$07
0810      JSR CLKOUT
0820      LDA #$0F
0830      AND ADDRH
0840      JSR CLKOUT
0850      LDA #$F0
0860      AND ADDRL
0870      JSR DIV16
0880      JSR CLKOUT
0890      LDA #$0F
0900      AND ADDRL
0910      JSR CLKOUT
0920      RTS
0930 ;CLOCK REGISTERS SUBROUTINE
0940 CLKOUT
0950      ORA #$00
0960      STA PORTA
0970      LDX #$10
0980 DELAY1 DEX
0990      BNE DELAY1
1000      ORA #CLK
1010      STA PORTA
1020      LDX #$10
1030 DELAY2 DEX
1040      BNE DELAY2
1050      AND #$EF
1060      RTS
1070 ;PORT DIRECTION SUBROUTINE
1080 PORTMODE
1090      LDA #$38
1100      STA PACTL
1110      STX PORTA
1120      LDA #$3C
1130      STA PACTL
1140      RTS
1150 ;DIVIDE BY 16 SUBROUTINE
1160 DIV16
1170      CLC
1180      LSR A
1190      LSR A
1200      LSR A
1210      LSR A
1220      CLC
1230      RTS
1240 PROGRAMR
1250 ;PROGRAM ROUTINE
1260      LDA #$00
1270      STA ADDRL
1280      LDA #$70
1290      STA ADDRH
1300      LDX #$FF
1310      JSR PORTMODE
1320      LDA #$00
1330      STA PORTA
1340      JSR SWPROG
1350 PROGRAM
1360      LDY #$00
1370      LDA (ADDRL),Y
1380      AND #$F0
1390      JSR DIV16
1400      JSR CLKOUT
1410      LDY #$00
1420      LDA (ADDRL),Y
1430      AND #$0F
1440      JSR CLKOUT
1450      JSR ADDROUT
1460      LDA #EN
1470      STA PORTA
1480      JSR DELAY
1490      LDA #$00
1500      STA PORTA
1510      INC ADDRL
1520      BNE PROGRAM
1530      INC ADDRH
1540      LDA ADDRH
1550      CMP #$90
1560      BNE PROGRAM
1570      JSR PROGEND
1580      LDX #$00
1590      JSR PORTMODE
1600      BRK
1610 DELAY
1620      LDX #$00
1630 START LDY #$01
1640 DELAY3 DEY
1650      BNE DELAY3
1660      DEX
1670      BNE START
1680      RTS
1690 CKEY
1700      LDA #TEXT6&255
1710      STA ADTEXL
1720      LDA #TEXT6/256
1730      STA ADTEXH
1740      JSR PRINTSCR
1750 CH   LDA $D01F
1760      CMP #$06
1770      BNE CH
1780      RTS
1790 ;EPROM VARIABLES
1800 EPVAR LDA #$60
1810      STA VADDRH
1820      LDY #$00
1830      LDX #$00
1840 VLOOP LDA VADDR,X
1850      STA VADDRL
1860      LDA EPROM,X
1870      STA (VADDRL),Y
1880      INX
1890      CPX #$08
1900      BNE VLOOP
1910      RTS
1920 EP64 .BYTE $70,$07,$00,$70,$00,$8
0,$00,$01
1930 EP32 .BYTE $80,$08,$00,$80,$00,$8
0,$00,$28
1940 EP16 .BYTE $88,$08,$80,$88,$80,$0
0,$80,$28
1950 VADDR .BYTE $08,$55,$73,$A3,$AC,$
CC,$D4,$F0
```

```
1960 OPENSCR
1970      LDX #IOCB2
1980      LDA #$03     OPEN CMD
1990      STA ICCOM,X
2000      LDA #DEVNAM&255
2010      STA ICBAL,X
2020      LDA #DEVNAM/256
2030      STA ICBAH,X
2040      LDA #$0C     WRITE CMD
2050      STA ICAX1,X
2060      LDA #$00
2070      STA ICAX2,X
2080      JSR CIOV
2090      RTS
2100 PRINTSCR
2110      LDX #IOCB2
2120      LDA #$0B     PUT CHARACTER
2130      STA ICCOM,X
2140      LDA ADTEXL
2150      STA ICBAL,X
2160      LDA ADTEXH
2170      STA ICBAH,X
2180      LDY #$00     DETERMINE LENGTH
2190 TY   LDA (ADTEXL),Y
2200      CMP #$7C
2210      BEQ PRINT
2220      INY
2230      JMP TY
2240 PRINT
2250      TYA
2260      STA ICBLL,X
2270      LDA #$00
2280      STA ICBLH,X
2290      JSR CIOV
2300      RTS
2310 DEVNAM .BYTE "E:",$9B
2320 CLOSE
2330      LDX #IOCB2
2340      LDA #$0C
2350      STA ICCOM,X
2360      JSR CIOV
2370      RTS
2380 GETCHAR
2390      LDX #IOCB2  GET CHARACTER
2400      LDA #$07     GET CMD
2410      STA ICCOM,X
2420      LDA #$00
2430      STA ICBLH,X LENGTH OF INPUT
2440      LDA #$02
2450      STA ICBLL,X
2460      LDA #GBUFH
2470      STA ICBAH,X DATA BUFFER LOC.
2480      LDA #GBUFL
2490      STA ICBAL,X
2500      JSR CIOV
2510      RTS
2520 EPTYPE
2530      LDA #TEXT&255
2540      STA ADTEXL
2550      LDA #TEXT/256
2560      STA ADTEXH
2570      JSR OPENSCR
2580      JSR PRINTSCR
2590      JSR GETCHAR
2600      LDA GBUF
2610      CMP #$31
2620      BEQ EPROM1
2630      CMP #$32
2640      BEQ EPROM2
2650      JMP EPROM3
2660 MODE
2670      JSR EPVAR
2680      LDA #TEXT1&255
2690      STA ADTEXL
2700      LDA #TEXT1/256
2710      STA ADTEXH
2720      JSR PRINTSCR
2730      JSR GETCHAR
2740      LDA GBUF
2750      CMP #$31
2760      BEQ SWRD
2770      JMP PROGRAMR
2780 EPROM1
2790      LDA #$33
2800      STA $6119
2810      JMP MODE
2820 EPROM2
2830      LDA #$2B
2840      STA $6119
2850      JMP MODE
2860 EPROM3
2870      LDA #$23
2880      STA $6119
2890      JMP MODE
2900 SWRD
2910      LDA #TEXT2&255
2920      STA ADTEXL
2930      LDA #TEXT2/256
2940      STA ADTEXH
2950      JSR PRINTSCR
2960      JSR CKEY
2970      JSR WAIT
2980      JSR CLOSE
2990      JMP READR
3000 SWPROG
3010      LDA $6119
3020      CMP #$33
3030      BEQ SW1
3040      CMP #$2B
3050      BEQ SW2
3060      JMP SW3
3070 SW1
3080      LDA #TEXT3&255
3090      STA ADTEXL
3100      LDA #TEXT3/256
3110      STA ADTEXH
3120      JSR PRINTSCR
3130      JSR CKEY
3140      JSR WAIT
3150      RTS
3160 SW2
3170      LDA #TEXT4&255
3180      STA ADTEXL
3190      LDA #TEXT4/256
3200      STA ADTEXH
3210      JSR PRINTSCR
3220      JSR CKEY
3230      JSR WAIT
3240      RTS
3250 SW3
3260      LDA #TEXT5&255
3270      STA ADTEXL
3280      LDA #TEXT5/256
3290      STA ADTEXH
3300      JSR PRINTSCR
3310      JSR CKEY
3320      JSR WAIT
3330      RTS
3340 PROGEND
3350      LDA #TEXT2&255
3360      STA ADTEXL
3370      LDA #TEXT2/256
3380      STA ADTEXH
3390      JSR PRINTSCR
3400      JSR CKEY
3410      JSR CLOSE
3420      RTS
3430 WAIT
3440      LDA #TEXT7&255
3450      STA ADTEXL
3460      LDA #TEXT7/256
3470      STA ADTEXH
3480      JSR PRINTSCR
3490      RTS
3500 TEXT .BYTE "(1) 2716",$9B,"(2) 27
32",$9B,"(3) 2764",$9B,"SELECT A NUMBE
R ",$7C
3510 TEXT1 .BYTE $9B,"(1) READ",$9B,"(
2) PROGRAM",$9B,"SELECT A NUMBER ",$7C
```

continued on next page

```
3520 TEXT2 .BYTE $9B,"SET ALL SWITCHES
 DOWN",$9B,$7C
3530 TEXT3 .BYTE $9B,"SET SWITCH 3 UP"
,$9B,$7C
3540 TEXT4 .BYTE $9B,"SET SWITCH 2 UP"
,$9B,$7C
3550 TEXT5 .BYTE $9B,"SET SWITCH 1,4,5
 UP",$9B,$7C
3560 TEXT6 .BYTE $9B,"PRESS [illegible] TO C
ONTINUE",$9B,$7C
3570 TEXT7 .BYTE $9B,"ONE MOMENT PLEAS
E...",$9B,$7C
```

foil those evil bulletin board crashers

BBS CRASHBUSTER

Article on page 12

LISTING 1

```
PE 2 REM BBS CRASHBUSTER, LISTING 1
TS 4 REM BY MATTHEW RATCLIFF
FG 6 REM (c) 1985, ANTIC PUBLISHING
FZ 10 DIM L$(255):GRAPHICS 0
DH 15 GOTO 2000:REM DON'T TYPE IN THIS LI
   NE OR LINES 2000 TO END IF YOU DON'T N
   EED HELP WITH LINE 1000
AC 20 ? "TYPE A STRING "
CI 30 INPUT L$
NA 40 IF L$="" THEN ? "[illegible]TRY SOMETHING!":G
   OTO 20
MH 50 GOSUB 1000
VV 60 ? "STRING IS NOW:"
AP 70 ? L$
ND 80 ? "YOU MADE ";A;" GARBAGE ERRORS"
UI 90 ? :GOTO 20
NX 1000 A=USR(ADR("[illegible]
   [illegible]
   [illegible]"),ADR(L$),LEN(L$))
AC 1010 RETURN
SZ 2000 POKE 766,1:? :? "1000 A=USR(ADR("
   ;CHR$(34);:FOR I=1 TO 70:READ X:? CHR$
   (X);:NEXT I
OG 2010 ? CHR$(34);"),ADR(L$),LEN(L$))":P
   OKE 766,0:? 15:FOR I=2000 TO 2050 STEP
    10:? I:NEXT I
OL 2020 ? :? "MOVE CURSOR OVER LINE NUMBE
   RS":? "BY PRESSING [RETURN]":? "THEN S
   AVE PROGRAM AND RUN AGAIN":END
SL 2030 DATA 169,0,133,212,133,213,104,24
   0,10,201,2,240,9,170,104,104,202,208,2
   51,230,213,96,104
TV 2040 DATA 133,215,104,133,214,104,104,
   168,177,214,133,216,41,127,56,201,32,1
   76,3,24,105,64,56,201
YK 2050 DATA 123,144,2,233,64,201,96,208,
   2,169,46,145,214,197,216,240,2,230,212
   ,136,16,218,96
```

LISTING 2

```
10 ; BBS CRASHBUSTER, LISTING 2
20 ; BY MATTHEW RATCLIFF
30 ; (c) 1985, ANTIC PUBLISHING
40 ;
50 ;FORM: A=USR(PROG,ADR(L$),LEN(L$))
60 ;
70 RESULT =   $D4       ; RETURN # OF BAD CH
ARACTERS
80 TXADR =    $D6       ;SAVE STRING ADDR
90 SAVCR =    $D8       ;SAVE CHARACTER TO S
EE IF CHANGED
0100      *=   $4000    ;CAN GO ANYWHERE
0110 START
0120      LDA #0        ;ZERO-OUT RESULT
0130      STA RESULT
0140      STA RESULT+1
0150      PLA           ;GET ARGS
0160      BEQ ERROR     ;DISALLOW BAD CALLS
0170      CMP #2        ;MUST BE 2
0180      BEQ AOK       ;GOOD..PROCESS IT
0190      TAX           ;BAD CALL, CLEAN UP
STACK
0200 ER1  PLA
0210      PLA
0220      DEX
0230      BNE ER1
0240 ERROR INC RESULT+1
0250 ;THIS WILL RETURN 256 IN CALLING
0260 ;VARIABLE, INDICATING INVALID CALL.
0270      RTS
0280 AOK  PLA
0290      STA TXADR+1
0300      PLA
0310      STA TXADR     ;GET STRING ADDRESS
0320      PLA
0330      PLA           ;GET LENGTH
0340      TAY           ;USE AS INDEX
0350 LOOP
0360      LDA (TXADR),Y
0370      STA SAVCR     ;SAVE CHARACTER
0380      AND #$7F      ;DISALLOW INVERSE
0390      SEC
0400      CMP #32       ;CHECK FOR CONTROL C
ARS
0410      BCS NCTL      ;NO CONTROL-GOOD
0420      CLC           ;YES, THEN ADD 64
0430      ADC #64       ;TO MAKE IT ASCII CH
ARACTER
0440 ;CONTROL-LETTERS & INVERSE-CONTROL-L
ETTERS
0450 ;BECOME EQUIVALENT VALID LETTERS.
0460 NCTL SEC
0470      CMP #123      ;NO CHARS ABOVE CHR$
(123),"z"
0480      BCC OK1
0490      SBC #64       ;TOO BIG, MAKE CTRL-
";" A ";"
0500 ;ALSO TAKES CARE OF ESCAPE-CTRL EDIT
 KEYS
0510 OK1  CMP #96       ;NOT CTRL-PERIOD EIT
HER
0520      BNE ALLOK
0530      LDA #46       ;CTRL-PERIOD, MAKE I
T PERIOD ONLY
0540 ALLOK STA (TXADR),Y
0550      CMP SAVCR
0560      BEQ TEST
0570      INC RESULT    ;KEEP "BAD" COUNT
0580 TEST DEY
0590      BPL LOOP
0600      RTS           ;CLEANED UP, BACK TO
 BASIC
0610      .END
```

BASIC TO MICRO ILLUSTRATOR

Article on page 17

LISTING 1

Don't type the TYPO II Codes!

```
EA 10 REM MICRO ILLUSTRATOR FILE LOADER
LI 15 REM BY CHARLES JACKSON
BM 20 REM ANTIC PUBLISHING
HB 30 DIM MAIN$(342),PIC$(15),MA$(55):POK
   E 709,PEEK(710)
QG 40 ? "↖↓↓↓↓↓↓(When you're through view
   ing the"
OH 50 ? "picture, press START to return":
   ? "to BASIC.)"
XV 60 ? "↑↑↑↑↑↑↑Picture to load";:POKE 70
   9,202
QP 70 INPUT PIC$
CL 80 MA$="[illegible]"
JZ 90 RESTORE 130
OL 100 FOR A=1536 TO 1556
CT 110 READ B:POKE A,B
CT 120 NEXT A
GS 130 DATA 162,16,169,1,157,72,3,169,0,1
   57,73,3,32,86,228,48,1,96,104,104,96
ON 140 MAIN$="[illegible]"
FI 150 MAIN$(55)="[illegible]"
EH 160 MAIN$(115)="[illegible]"
ES 170 MAIN$(175)="[illegible]"
UU 180 MAIN$(228)=CHR$(155)
TY 190 MAIN$(229)="[illegible]"
NZ 200 MAIN$(291)="[illegible]"
DT 210 GRAPHICS 8+16:N=USR(ADR(MA$)):REM
   CHANGE TO ANTIC "E"
AW 220 CLOSE #1:OPEN #1,4,0,PIC$
PT 230 A=USR(ADR(MAIN$)):REM LOAD THE KOA
   LA FILE
LG 240 CLOSE #1
XT 250 IF PEEK(53279)<>6 THEN 250
ST 260 GRAPHICS 0
OF 270 END
```

game of the month

BOX-IN

Article on page 79

LISTING 1

Don't type the TYPO II Codes!

```
VJ 1 REM BOX-IN
DY 2 REM BY J.D. CASTEN
FD 3 REM (c) 1985, ANTIC PUBLISHING
IU 5 POKE 559,N:GOTO 500
CJ 100 FOR I=1 TO W:POSITION 12,23:? #6;P
   EEK(19);:IF S=15 THEN 155
WA 105 C=71-C:LOCATE X,Y,L:IF L=32 THEN 1
   45
FF 110 IF L=161 THEN 125
DQ 115 IF L=132 THEN X=OX:Y=OY:GOTO 150
MO 120 GOTO 400
PB 125 X1=(OX<X)-(OX>X):Y1=(OY<Y)-(OY>Y):
   X2=X:Y2=Y
TX 130 X2=X2+X1:Y2=Y2+Y1:LOCATE X2,Y2,Z:I
   F Z=161 THEN 130
EU 135 IF Z=32 THEN COLOR 161:PLOT X2,Y2:
   GOTO 145
HS 140 X=OX:Y=OY:GOTO 150
HV 145 COLOR 32:PLOT OX,OY:POKE 53767,143
   :POKE 53767,N
NW 150 COLOR C:PLOT X,Y:OX=X:OY=Y
WR 155 S=PEEK(632):X=X+(S<8)-(S>8 AND S<1
   3):Y=Y+(S=9 OR S=13 OR S=5)-(S=10 OR S
   =14 OR S=6):NEXT I:H=H+SGN(X-H)
LY 170 V=V+SGN(Y-V):LOCATE H,V,L9:IF (H=0
   X AND V=OY) OR L9=C THEN 400
NH 175 IF L9=32 THEN 185
EG 180 J=H:H=OH:LOCATE H,V,L9:IF L9>128 T
   HEN V=OV:H=J:LOCATE H,V,L9:IF L9>128 T
   HEN H=OH:GOTO 190
BS 185 IF H<>OH OR V<>OV THEN COLOR 32:PL
   OT OH,OV:OH=H:OV=V:POKE 53279,N:COLOR
   3:PLOT H,V
PB 190 FOR J=-1 TO 1:FOR I=-1 TO 1:LOCATE
    H+J,V+I,L1:IF L1=3 OR L1=161 OR L1=13
   2 THEN NEXT I:NEXT J:GOTO 200
MN 195 GOTO 100
GG 200 TI=PEEK(19):POSITION 3,22:? #6;"YO
   U TRAPED HIM":FOR J=N TO 255 STEP 0.5:
   SOUND N,J,12,15:NEXT J:POKE 53761,N
JE 205 POSITION 3,22:? #6;"  PRESS START
   ":IF PEEK(53279)<>6 THEN 205
OA 210 TRAP 515
KR 300 FOR J=N TO 23:COLOR 32:PLOT N,J:DR
   AWTO 19,J:SOUND N,30-J,8,8:NEXT J:POKE
    53761,N:RETURN
XE 400 POSITION 6,22:? #6;"YOU LOSE":COLO
```

continued on next page

```
   R 32:PLOT OH,OV:COLOR 3:PLOT OX,OY:FOR
    J=N TO 255:SOUND N,J,8,15
OE 405 IF J<16 THEN POKE 712,15-J
BO 410 NEXT J:POKE 53761,N:GOTO 205
SN 500 A=PEEK(106)-2:POKE 106,A:GRAPHICS
   17:POKE 756,A:A=A*256:X=USR(ADR("h♥K
   LjN ♥LKM PJ◆"))
AM 505 FOR J=8+A TO 48+A:READ B:POKE J,B:
   NEXT J:POKE 559,34:COM D$(86):POKE 708
   ,28:POKE 709,200:POKE 710,154
ZZ 510 POKE 711,86:D$="%press START to pl
   ay box in press SELECT to change t
   he difficulty %press ST":D=5
NM 515 POSITION 5,7:? #6;"!box in!":POS
   ITION 4,9:? #6;"by jd casten":POSITION
    2,3:? #6;"%":POSITION 15,2
QF 520 ? #6;"":POSITION 15,3:? #6;"
   ":POSITION 15,4:? #6;"":COLOR 161:P
   LOT N,N:DRAWTO 19,N:DRAWTO 19,21
NJ 525 DRAWTO N,21:DRAWTO N,N:PLOT 4,15:D
   RAWTO 15,15:DRAWTO 15,17:DRAWTO 4,17:P
   LOT 4,16
QG 530 FOR J=1 TO 77:POSITION 5,16:? #6;D
   $(J,J+9):I=P:P=PEEK(53279):IF P=5 AND
   I<>P THEN D=D-1:IF D=N THEN D=5
EZ 535 IF P<>6 THEN FOR K=1 TO 15:NEXT K:
   POSITION 4,11:? #6;"DIFFICULTY:";6-D:N
   EXT J:GOTO 530
TV 540 GOSUB 300:COLOR 132:PLOT N,N:DRAWT
   O 19,N:DRAWTO 19,21:DRAWTO N,21:DRAWTO
    N,N:POKE 53768,5:POSITION 7,23
JT 545 ? #6;"TIME:";:COLOR 161:FOR J=1 TO
    100:X=INT(RND(0)*18+1):Y=INT(RND(0)*2
   0+1):PLOT X,Y:SOUND N,8,10,8
CN 550 POKE 53761,N:NEXT J:FOR J=15 TO N
   STEP -0.2:SOUND N,J,10,J:NEXT J:C=34:H
   =18:V=20:OH=H:OV=V:X=1:Y=X:OX=X:OY=Y
LN 560 COLOR 34:PLOT X,Y:COLOR 3:PLOT H,V
   :S=15:W=D*2-1:POKE 19,N:POKE 20,N:GOTO
    100
PJ 900 DATA 255,129,189,165,165,189,129,2
   55,28,28,9,127,92,28,52,6,66,36,60,90,
   60,66,189,129,255,255,255,255,255,255
SJ 910 DATA 255,255,56,56,144,254,58,56,4
   4,96,0
```

st section

ST LOGO EXPLORATION

Article on page 60

LISTING 1

```
TO INIT1
MAKE "HEX1 "000102030405060708090A0B0C
0D0E0F101112131415161718191A1B1C1D1E1F
"
END

TO INIT2
MAKE "HEX2 "202122232425262728292A2B2C
2D2E2F303132333435363738393A3B3C3D3E3F
"
END

TO INIT3
MAKE "HEX3 "404142434445464748494A4B4C
4D4E4F505152535455565758595A5B5C5D5E5F
"
END

TO INIT4
MAKE "HEX4 "606162636465666768696A6B6C
6D6E6F707172737475767778797A7B7C7D7E7F
"
END

TO INIT5
MAKE "HEX5 "808182838485868788898A8B8C
8D8E8F909192939495969798999A9B9C9D9E9F
"
END

TO INIT6
MAKE "HEX6 "A0A1A2A3A4A5A6A7A8A9AAABAC
ADAEAFB0B1B2B3B4B5B6B7B8B9BABBBCBDBEBF
"
END

TO INIT7
MAKE "HEX7 "C0C1C2C3C4C5C6C7C8C9CACBCC
CDCECFD0D1D2D3D4D5D6D7D8D9DADBDCDDDEDF
"
END

TO INIT8
MAKE "HEX8 "E0E1E2E3E4E5E6E7E8E9EAEBEC
EDEEEFF0F1F2F3F4F5F6F7F8F9FAFBFCFDFEFF
"
END

TO PRNT :A
MAKE "A 2 * :A
IF (:A <= 62) [PRNT1 GO "PRNTZ]
IF (:A <= 126) [PRNT2 GO "PRNTZ]
IF (:A <= 190) [PRNT3 GO "PRNTZ]
IF (:A <= 254) [PRNT4 GO "PRNTZ]
IF (:A <= 318) [PRNT5 GO "PRNTZ]
IF (:A <= 382) [PRNT6 GO "PRNTZ]
IF (:A <= 446) [PRNT7 GO "PRNTZ]
IF (:A <= 510) [PRNT8 GO "PRNTZ]
LABEL "PRNTZ
IF (:VAL <= 32) [MAKE "VAL 46]
IF (:VAL >= 128) [MAKE "VAL 46]
MAKE "POST (16 - :CNT) + 1
.REPLACE :POST :ASCL CHAR :VAL
TYPE :HCHR
END

TO PRNT1
MAKE "HCHR PIECE :A+1 :A+2 :HEX1
END

TO PRNT2
MAKE "A :A-64
MAKE "HCHR PIECE :A+1 :A+2 :HEX2
END

TO PRNT3
MAKE "A :A-128
MAKE "HCHR PIECE :A+1 :A+2 :HEX3
```

```
END

TO PRNT4
MAKE "A :A-192
MAKE "HCHR PIECE :A+1 :A+2 :HEX4
END

TO PRNT5
MAKE "A :A-256
MAKE "HCHR PIECE :A+1 :A+2 :HEX5
END

TO PRNT6
MAKE "A :A-320
MAKE "HCHR PIECE :A+1 :A+2 :HEX6
END

TO PRNT7
MAKE "A :A-384
MAKE "HCHR PIECE :A+1 :A+2 :HEX7
END

TO PRNT8
MAKE "A :A-448
MAKE "HCHR PIECE :A+1 :A+2 :HEX8
END

TO DUMP :B
TYPE :B TYPE [: ]
MAKE "ASCL [- - - - - - - - - - - - - - -
- - -]
PRTLN :B 16
MAKE "B :B+16
MAKE "ASCL [- - - - - - - - - - - - - - - - -
- - -]
DUMP :B
END

TO INITALL
INIT1 INIT2 INIT3 INIT4 INIT5 INIT6 IN
IT7 INIT8
END

TO DOLINE
MAKE "A .EXAMINE :B
MAKE "VAL :A
MAKE "B :B+1
PRNT :A
MAKE "CNT :CNT-1
END

TO PRTLN :B :CNT
LABEL "PRTLN2
IF [:CNT <=0] [GO "PRTLN9]
DOLINE
GO "PRTLN2
LABEL "PRTLN9
TYPE [ ] TYPE :ASCL PRINT [ ]
END
```

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U.K. GETS ANTIC CATALOG

by GIGI BISSON, **Antic** Assistant Editor

You are holding the most expensive magazine in the United Kingdom.

That's right—**Antic**. We were surprised to learn that our British cousins were paying black market prices for their copies of "The Atari Resource." Worse yet—when they finally got **Antic** (several weeks late), the catalog stapled inside tormented them with programs they couldn't order.

Well, we have some good news for Antic U.K. readers. All the Antic Catalog software as well as the magazine itself will now be widely available throughout the United Kingdom.

Jerry Howells, General Manager of Software Express International, flew in from England to clinch the deal with **Antic**. Software Factory, his distribution company, markets a wide variety of Atari products in the British Isles, Saudi Arabia and Australia.

Antic Catalog software will be available for the same amount in British pounds as U.S. dollars. Due to the exchange rate, this software will now actually be cheaper in the U.K.

During his visit to San Francisco last month, Howells explained some important differences between computing in the United States and the United Kingdom.

"The British market has always been underestimated," he said. "There are computers in 25% of U.K. homes. Brits are wild about computers, but refuse to shell out a lot of money for them. Clive Sinclair's bargain-price $49 Z81 model is still the most popular computer in the U.K. It set a taste for cheap computers."

Now that the price of the Atari 800XL has plummeted, it's enjoying a surge of popularity overseas. The XL and XE are expected to be big hits this Christmas.

The ST is also receiving an enthusiastic welcome because of its power and a price of only 750 pounds. Howells said 140 developers are already writing software for it.

"We used to read **Antic** and wait four months for the software to come to the U.K.," he said. "Now we're getting new releases at the same time."

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